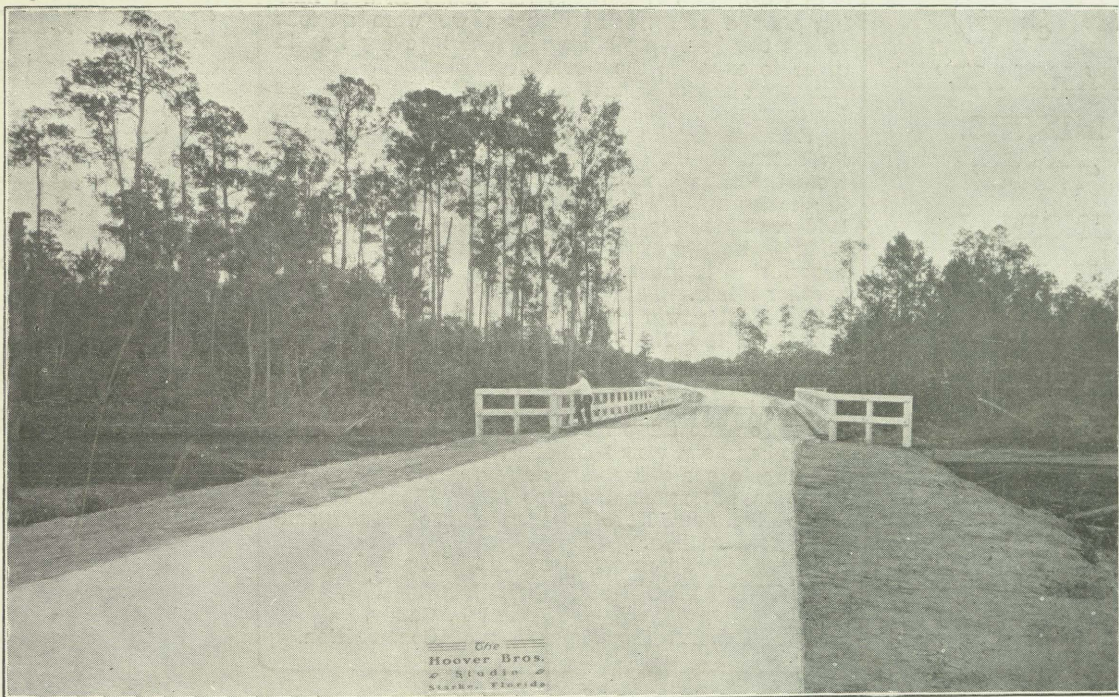


FLORIDA HIGHWAYS



Vol. 1

SEPTEMBER, 1924

No. 10

PUBLISHED BY THE STATE ROAD DEPARTMENT

\$1.00 Per Year

Single Copies 10c

Fuller Service

Means More Profit To The Contractor

ALFRED L. GANDY'S LETTER

BAY CONSTRUCTION COMPANY

St. Petersburg, Florida
P. O. Box 420

August 14, 1924.

W. R. Fuller,
408 Zack Street,
Tampa, Florida.

Dear Sir:

In rushing to completion the Gandy Bridge, linking Tampa and St. Petersburg, we were anxious to get the best possible equipment in every line in order to expedite the work.

After a thorough test of several kinds of mixers for concrete, we found Ransome Mixers far superior, in that we could actually mix a "batch a minute." By actual count, fifty-nine seconds were consumed from the time the rock, sand and cement were put in the hopper till the concrete was poured on the bridge. This case is not an exception, but the rule. In fact, the mix proved under laboratory tests to be superior to a previous mix taking four minutes in another mixer.

The ideal power for operating Ransome Concrete Mixers is the Novo engine. These engines have given us uninterrupted service on our mixers and have proven most satisfactory.

We wish also to call attention to the fact that upkeep on the three Ransome Concrete Mixers now in use has been very light and the service has measured up to our every expectation.

We cannot recommend too highly Ransome Concrete Mixers and Novo Engines to anyone doing concrete construction.

Yours very respectfully,

THE BAY CONSTRUCTION COMPANY,

Alfred L. Gandy,

General Superintendent of Construction.

**A
Complete Stock
of
"RANSOME"
MIXERS
"NOVO"
ENGINES
HOISTS
and
PUMPS
Always on Hand**

**AGENTS
for
"NORTHWEST"
CRANES
SHOVELS
DRAG LINES
Also
"GALLION"
Line of
ROAD
MACHINERY**

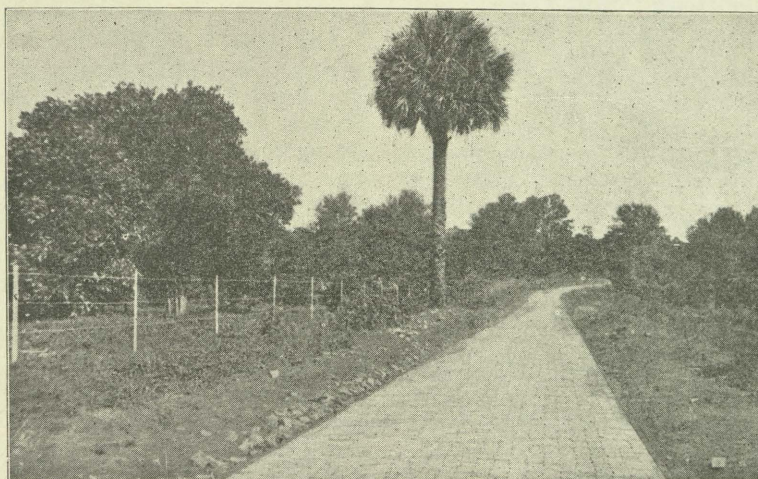
**WRITE, PHONE OR WIRE
FOR PRICES AND DELIVERIES**

**Rock, Sand, Cement, Base Limerock, Tenn Chatts, Slag
and Filler Dust**

**ALSO A COMPLETE LINE OF
Contractors Equipment**

**W. R. FULLER
TAMPA, FLORIDA**

FLORIDA HIGHWAYS



Vol. 1

SEPTEMBER, 1924

No. 10

The Elimination of Grade Crossings

Ever since the first issue of Florida Highways we have had a great deal to say on the subject of the menace of the railway grade crossing. It has been a problem which has occupied the attention of the Department in season and out of season, and because of its importance we are gratified beyond measure to announce that we have entered into an agreement with the trunk line railways of Florida, under the terms of which this menace will be largely eliminated. After a series of conferences between the Department and representatives of the Seaboard Air Line, the Atlantic Coast Line, the Louisville & Nashville and the Florida East Coast, an agreement has been entered into between these railroad companies on the one hand and the Department on the other. It is but fair to state that we found the railway companies most fair, and as anxious as we ourselves to solve this great problem.

It is the belief of the Department, formed after months of careful and painstaking study, that this agreement is the longest step forward which has been taken by the Department as a single proposition since its creation. The terms of the agreement are eminently just, and evince, as nothing else could, the earnest desire of the parties to take care of the situation and obviate the traffic menace always an incident of railway grade crossings.

The Agreement.

As to the terms of the agreement, they speak best for themselves, and the entire agreement is submitted herewith:

This Agreement, Made and entered into by and between the State Road Department of Florida, party of the first part, and Atlantic Coast Line Railroad Company, Seaboard Air Line Railway Company, Florida East Coast Railway Company and Louisville & Nashville Railroad Company, parties of the second part, witnesseth:

Whereas, said party of the first part is carrying on throughout the State of Florida a large program of highway improvement and construction, and

Whereas, the parties of the second part desire to cooperate with the party of the first part in the elimination as far as possible of grade crossing accidents, and

Whereas, the parties hereto recognize that these accidents usually occur on the main travelled highways, therefore

It is agreed by and between the parties hereto as follows:

The parties hereto will cooperate with each other in the establishment, construction, re-location and repair of highway crossings under the jurisdiction of said State Road Department upon the following terms and conditions:

(1)

Whenever a State road crosses an existing railroad right-of-way, the State Road Department shall have the right to determine whether such State road

(Continued on Page Four)



Florida Highways

Published Monthly
Official Publication of the State Road Department

PERSONNEL OF DEPARTMENT

H. B. PHILIPS, *Chairman*

W. J. HILLMAN

I. E. SCHILLING

E. P. GREEN

W. M. CORRY

ELLA CREARY THOMPSON, *Secretary*

PERSONNEL OF EMPLOYEES IN GENERAL CHARGE OF THE WORK OF THE DEPARTMENT

Engineering Division

J. L. Cresap.....	State Highway Engineer
L. K. Cannon.....	Ass't State Highway Engineer
G. L. Derrick.....	Bridge Engineer
C. W. DeGinther.....	Ass't Bridge Engineer
Harvey A. Hall.....	Testing Engineer
F. W. Berry, Jr.....	Office Engineer
John R. Stewart.....	Supt. of Equipment
R. L. Bannerman.....	Div. Engr. 1st Division
M. P. Philips.....	Div. Engr. 2nd Division
H. C. Green.....	Div. Engr. 3rd Division
L. B. Thrasher.....	Div. Engr. 4th Division
A. W. Kinney.....	Div. Engr. 5th Division

Accounting Division

S. L. Walters.....	Auditor
Bettie V. Herring.....	Bookkeeper
Jewell Smith Jones.....	Bookkeeper
C. J. Camp.....	Bookkeeper

This magazine is edited in the offices of the State Road Department, Tallahassee, and published monthly. Subscription rate, one dollar per year. Permission is granted to republish, with proper credit, the matter contained herein.

Application has been made for transmission through the mails as second-class matter.

B. A. Meginniss, Attorney for the Department,
Editor and Business Manager



THE MEN IN THE FIELD

On page 9 of this issue we present two photographs which give an idea of some of the difficulties and hardships encountered by the men in the field. This is just one phase of the work which is carried on by these loyal representatives of the Department and it furnishes striking evidence of their devotion to their profession.

During a period of several months traveling into every part of the State and observing the work which is done by the division engineers, project engineers and all the employees of the Department, the writer has come to a full appreciation of their sterling worth and the cheerful, hearty and painstaking manner in which they go about their respective tasks. In all that time, he has yet to hear one word of complaint or discouragement—and yet he has seen many situations which would cause a man of less than strong fibre to be discouraged and to cavil and complain.

In the final analysis, theirs is the duty of actual road construction, and they enter upon this duty with a devotion which would be a credit to any profession. Their passion is "to do the job" and to do it right and into that effort they put all that they have of loyalty, ability and unswerving devotion. They are "Road Builders" in all the fine significance of the term, and they are on the job in season and out of season.

The Department is justly proud of its men in the field—there can be no finer body of men.

COVER PICTURE

The photograph on this month's cover shows a stretch of State Road No. 13 in Bradford County near Starke. The contractor for this rock base job was L. M. Gray, and the funds for the work were supplied by bond funds of Bradford County. The work was done according to the specifications and under the supervision of the Department.

THE EDITOR'S SON SAYS:

TOURING

I like to tour, it's mostest fun
To watch that old speedometer run.

Dinner by the roadside—in some shady nook—
By a noisy, running, babbling brook.

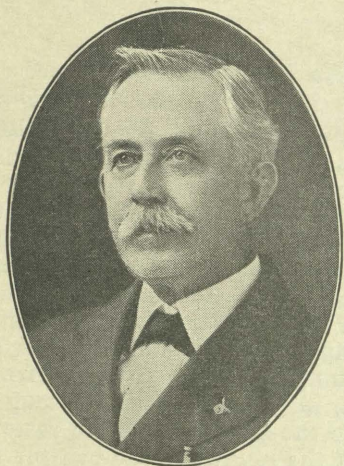
To run that flivver at fifty-five,
Gee, ain't I glad that I'm alive!

We pitch our tents when it ain't quite night,
Then we turn on the auto light.

We go to bed when we're tired outright,
And then we sleep until daylight.

—By Ben A. Meginniss, Jr. (Aged 10).

Chairman's Column



THE RAILWAY CROSSING AGREEMENT

With relation to the construction and maintenance of our State Road System, we think the fact that we have been able to reach an agreement with the principal railroad companies as to railroad crossings, as set forth in this issue, is a matter of more than passing interest.

A grade crossing is always a thing of danger. Build a highway with such crossings on it, and you have a highway with danger spots on it. The idea that all danger may be avoided by careful driving is not correct in every case. The records show cases where careful drivers were killed. When we think of this subject of grade crossings we are reminded of what the man out west said about the Indian. He expressed the opinion that the only good Indian was a dead Indian. If it were permissible to so express it, we might say that the only good grade crossing is one that ain't. Our agreement with the railroad companies renders possible the elimination of grade crossings on our system of State roads within the course of a few years.

An examination of our road map will disclose the fact that our State roads are so located that they serve the whole State, and when these roads are constructed they will carry a great part of the motor traffic of the State. One can readily see how widespread will be the benefit accruing from the step that has been taken.

We think the terms of the agreement are fair and just. The highway and the railroad are today the two great means of inland transportation. The one is owned and maintained by the State, the other by a corporation. The duty of furnishing safe means of transportation is equal as between these two owners. Where these two duties or interests come in contact it appears that there should be a corresponding division of the burden of providing a safe means of transportation. This thought is expressed in the agreement we have entered into. It is a fifty-fifty arrangement, with this reservation in favor of the highway. It is left to the State, acting through the agency of the road department, to determine the character of the crossing, that is,

whether it shall be at grade, over-head or under-pass.

In this connection it may be well to again call attention to the fact that the difficulties involved in this matter of railroad crossings can, in many cases, be avoided by a proper location of the line of the highway. We are being continually importuned to locate highways along such lines as to necessitate railroad crossings. May we not hope that the time will come when our people will realize the danger of the grade crossing, and the fact that in many cases it is not practicable to get an over-head or under-pass, and cooperate with us in so locating the highway as to avoid crossing the railroad if it is practicable to do so.

It is never too early in the season for motorists to remember that even on a single track railroad trains come from both ways.—Bemidji (Minn.) Pioneer.

"No single improvement has done more for the general good of the country than the development of our highway systems."—President Harding.

Today, more clearly than ever before, improvement of means of communication is one of the great forces making for cultural and economic advance.—President Coolidge.

Many a driver has failed to realize that a car moving along the highway at forty miles an hour is a big responsibility.—St. Paul Pioneer Press.

Borrowed Epitaphs

Tom Jones has gone to heavenly heights;
He tried to drive without his lights.

Jack Hayes this busy life forsakes;
He never would re-line his brakes.

Here's all that's left of Amos Bossing;
He tried to beat it to the crossing.

No more from Brown are earthly smiles;
He took the curve at forty miles.

Ted Small has gone to his abode;
He kept the middle of the road.

Here lies our friend, poor Tony Dix;
For booze and gasoline won't mix.

Jim Henry's friends are all bereft;
He made a short turn to the left.

Ben Gray is free from earthly pains;
A rainy day—he had no chains.

Poor Bill's beneath the sod, alas!
He speeded up and tried to pass.

Now Tom has joined the heavenly band;
He tried to drive it with one hand.

THE ELIMINATION OF GRADE CROSSINGS

(Continued from Page One)

and railroad shall cross each other at grade, or by over-pass or under-pass, under the terms and conditions of this agreement.

The State Road Department may under this agreement provide for the elimination of existing grade crossings of State roads over existing railroad tracks.

(2)

When it is provided that an over-pass crossing of a highway over an existing railroad shall be established, either as a new project or as the improvement of an existing crossing, the railroad involved shall be responsible for one-half of the entire cost of the bridge which shall span the opening over the tracks of the railroad from abutment to abutment and including such abutments; and the State Road Department shall be responsible for the balance of the cost. The railroad company involved shall maintain the supporting abutments and bents of the bridge which shall span the opening over the tracks of the railroad from abutment to abutment; and the State Road Department shall maintain the balance of the structure. When an over-pass is constructed, it shall be so constructed as to be sufficient to accommodate at least two railway tracks; this requirement may be waived and construction for one railway track provided for at the option of the railway company.

(3)

When it is provided that an under-pass crossing of a highway under an existing railroad shall be established, either as a new project or as the improvement of an existing crossing, the railroad involved shall be responsible for one-half of the expense of all excavations through the existing railroad fill of the railroad right-of-way and one-half of the complete cost of the structure necessary to carry the railroad tracks on the railroad right-of-way including the foundation, sub-structure and super-structure; and the State Road Department shall be responsible for the balance of the cost. The railroad company involved shall maintain the abutments and the super-structure of such under-pass and the State Road Department shall maintain the roadway and the drainage thereof. When an under-pass is constructed, it shall be so constructed as to be sufficient to accommodate at least two railway tracks; this requirement may be waived and construction sufficient for one railway track provided for at the option of the railway company.

(4)

When it is provided that a crossing at grade shall be established over a railroad, either as a new project or as a re-location of an existing crossing, the railroad company involved shall be responsible for one-half of the cost of such crossing between points ten (10) feet beyond the end of the cross ties on each side of its tracks; and the State Road Department shall be responsible for the balance of the cost. The railroad company involved shall maintain the

crossing between points ten (10) feet beyond the end of the cross ties on each side of its tracks and the State Road Department shall maintain the balance of such crossing.

(5)

Where a new line of railroad, owned or controlled by the parties hereto, crosses an existing highway under the jurisdiction of the State Road Department, unless said State Road Department and the railroad shall agree for a crossing at grade, (in which event section four shall apply) the railroad shall have the right to elect whether said highway shall be carried over or under the proposed railroad track. In case it elects that the highway shall be carried over the railroad then the State Road Department shall bear one-half of the cost of the bridge spanning the railroad tracks, from abutment to abutment, including abutments, and the railroad shall provide the necessary fills to restore the existing width of the highway road-bed for the highway approaching said bridge, which shall be on a grade of five per cent unless otherwise agreed upon, and shall cooperate with the State Road Department in the reconstruction of the pavement disturbed to an amount equal to the appraised value of the existing pavement so disturbed. In case the railroad shall elect that the railroad shall be carried over the highway, then and in that event the State Road Department shall pay one-half of the cost of the railroad bridge spanning the highway, including the abutments thereto, and the railroad shall provide such fills for its tracks approaching said bridge as may be necessary.

The same policy is to prevail as to elimination of grade crossings over new railroad construction as is applied in the case of old railroad construction; that is, the elimination of a grade crossing over new railroad construction will be required only under the same circumstances and conditions as would cause the elimination of a grade crossing over old construction, and there shall be no discrimination as between the two types of construction.

The construction of additional track or tracks on an existing right-of-way of an existing railroad shall not be considered new construction but crossings of highways under the jurisdiction of the State Road Department over such multiple track lines shall be governed by the provisions of Sections one, two, three and four hereof.

(6)

No railroad shall be obligated under this proposal and its acceptance to expend in any one calendar year a sum in excess of one-fifth of one per cent of its total gross operating revenue derived from business in the State of Florida both interstate and intrastate for the calendar year next preceding; provided, that this clause shall not preclude consideration of any crossing improvement by any railroad company or companies under this proposal and the participation of such company or companies in such improvement provided the exigencies of the case and the circumstances of the company or companies in the judgment of its officers warrant such improvement.

(7)

The agreement shall be effective from and after this, the 3rd, day of July, A. D. 1924.

(8)

Whenever an overhead bridge, under-pass, or grade crossing, is substituted for an existing grade crossing, the existing grade crossing shall be eliminated, closed and vacated.

(9)

This agreement shall remain of force until terminated by one year's written notice from either party unto the other.

STATE ROAD DEPARTMENT OF FLORIDA,

By H. B. Philips, Chairman.

Attest: Ella Creary Thompson, Secretary.

ATLANTIC COAST LINE RAILROAD COMPANY,

By Lyman DeLano, Executive Vice-President.

SEABOARD AIR LINE RAILWAY COMPANY,

By W. L. Stanley, Vice-President.

FLORIDA EAST COAST RAILWAY COMPANY,

By H. N. Rodenbaugh, General Manager.

LOUISVILLE & NASHVILLE RAILROAD CO.

By W. L. Mapother, President.

We are convinced that in concluding this agreement the Department has taken a long step forward in safeguarding the highways of the State, and has made it possible to gradually but effectively eliminate practically all the hazardous grade crossings on the State road system.

So far as we can ascertain, this is the first time that such a result has been attained in any State by direct and personal conferences between the interested parties, and this fact testifies very convincingly to the earnest and business-like manner in which the problem was approached from both sides.

Unmarked Highways

Dark Wayfarer—Does ah know where the Fo'th Nat'l Bank is?

Why Boss, Ah don't even know where is the first Nat'l Bank.—Life.

Changes in the Old Home Town

"No Hitching Here," the sign once read,
(Yes, backward we are harking)—
But since the old town forged ahead
The legend reads "No Parking."

—Detroit Motor News.

We've Been There

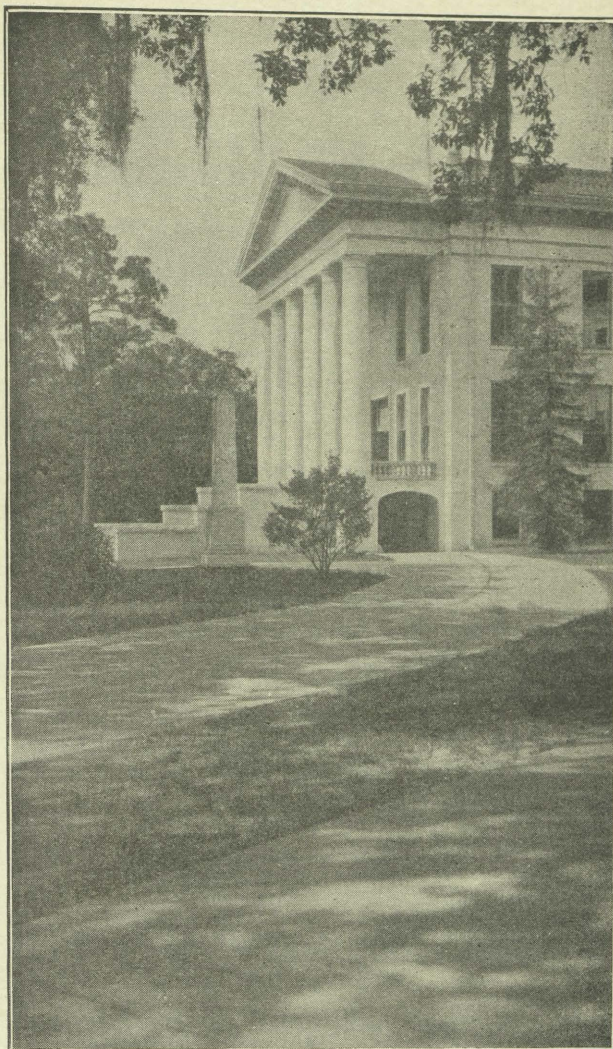
The Maiden: Not very cheery, are you?

The Youth: No, I'm afraid I'm beastly sentimental, but when I think what we've been to each other all this Summer and that in a month I shall have forgotten even your name—well, I can't help feeling it a bit.—Lampoon.

It Did Then

"Doesn't her singing move you?"

"It did once when I lived in the adjoining flat."
—Exchange.



The East Portico of Florida's Capitol. On this Porch the Inauguration Ceremonies are Held.

Advanced

The very modern artist was explaining his theories.

"You see," he said, "what we aim at is the elimination of the egocentric vision, without destroying the essential unity of the subconscious reflex. Do you follow me?"

"I am well ahead of you," said his friend. "I came out of the asylum yesterday."—Boston Traveler.

On His Way

The other day a man dashed into Grand Central Station with just one minute to catch the Twentieth Century. He made the ticket window in a series of slides, skids and jerks.

"Quick! give me a round trip ticket!" he grasped.

"Where to?"

"B-b-back here, you damfool."

Surely Is

Teacher: 'An heirloom is something that has been handed down from father to son.'

Small Boy: "That's a funny name for pants."—The Kablegram.

Basic Principles of Highway Management and Finance

An Address Before Virginia Good Roads Association, Roanoke, Virginia

By THOMAS H. MacDONALD, Chief of the U. S. Bureau of Public Roads

Convinced of the economic wisdom of improving our highways, we have made the past decade a period of unparalleled activity in road construction in the United States. We have set our hands to the labor of building up a system of roads—State by State and county by county and the country as a whole, and we have made remarkable progress toward that goal. But just now there seems to be a period of hesitation or reluctance on the part of the public to carry the responsibility of continuing the work that has been well begun to its logical conclusion—the provision of an adequate system of highways for the ever increasing highway traffic. The suggestion is made in some quarters that we have gone far enough in building highways, and many other equally thoughtless comments and criticisms are more or less common.

It is precisely this typically American trait that is at the root of the greatest difficulties faced by highway officials today—the unwillingness on the part of the public, first, to ascertain the determining facts in the highway situation and, having done so, to use these facts as a guide governing the course of action until the desired objective—an improved system of roads—is reached.

Tremendous Effort Required

To build these highways that are well nigh universally desired there is need of labor, material, organization, contractors, engineers, transportation of materials—all of which mean money. If we really want adequate highway service that money is absolutely essential. And yet it seems more than difficult to obtain from the public a general understanding of the tremendous effort that must be made in every State and in all the States to carry on the construction and maintenance of a sufficient mileage of highways to give adequate service.

Those in responsible charge of the road work in the States and Federal Government are making a serious effort to bring before the public a full statement of the need and a fair and complete disclosure of their activities in meeting the need. They are endeavoring to make perfectly plain the principles by which they are governed, and the reasons for the course of action they are following. And, all too frequently, this policy of openness and sincerity is taken advantage of, and the information so freely disclosed becomes the basis of attacks, unfair, unjust and viciously destructive.

It is surprising that such attacks are credited by thinking people. The medical quack who would deny all the experience, studies and research of the medical profession which, year by year, have developed into what is now the modern science of medicine and surgery would have no following among the thinking public. It is the same with the law. Society has secured for itself freedom of action, protection of life and property after long years during

which principles were laid down one by one to form the structure we call the law; and we do not highly abandon a single principle. So also the future of highway building will prosper or fail to prosper in the proportion that it follows or fails to follow and put into force and effect those principles which have been brought out of the experience of the past.

Principles Clearly Established

It has taken a long time and the road building efforts—success and mistakes—of many States, to crystallize these principles, but they are now so clearly established that he who would deny them simply betrays his own lack of understanding of the definite progress which has been made in the science of highway administration, operation and finance.

It was for the purpose of encouraging the general adoption of these principles that the Federal Government in 1916, made its first appropriation for road building. The Federal law is not an arbitrary set of rules and regulations, but rather a clear-cut delineation of the principles which have proved successful in application over a period of 30 years. These principles have not only proved successful in the States where they have been in effect for the longest period; they have proved, in fact, the only methods that will insure a continuity of successful administration of the highways and produce both new construction and continuous maintenance suited to the needs of any State.

Roads Divide Into Four Classes

One of these principles, clearly established by experience, is that the economic development of the country calls for roads of four classes. Whether they are recognized as such or not there are roads of the four classes in every State and these classes are: First, the interstate roads; second, the roads which are of importance to a whole State; third, the roads of country-wide importance; and fourth, the local roads or roads which serve only one small community. The development of the country has already brought into existence roads of four classes, and it is a first principle of proper highway administration to recognize the difference that exists. The roads should be grouped in their proper classes and the duty of constructing and maintaining each class should be acknowledged and accepted by the proper government unit. It is not right to expect, as we not infrequently have expected, the county to bear the expense of a highway which is actually of greater importance to the State than the county.

The existence of roads of interstate importance has been recognized by the Federal Highway Act and provision has been made for the segregation of such roads into an integral system, not exceeding in mileage seven per cent of the total road mileage of the State, upon which funds appropriated by the

Federal Government are to be spent in aid of construction.

The interstate and State systems will generally be coincident, although probably not co-extensive, but there will generally be a clear line of demarcation between the State and county roads and the county and local roads.

Adequate State Departments Essential

There follows from the acceptance of such a classification the necessity for the establishment of an adequate State highway organization to take over the duty of building and maintaining the roads which are peculiarly the interest of the State, and this is another of the principles, developed through years of experience, that is recognized and given the force of law by the Federal Aid measure.

Now it is carrying the logic of the analysis only one step farther to set up a third fundamental principle the idea that the roads, which are of importance to the State as a whole and which the State has provided an organization to administer, should be built and maintained with State funds derived from the citizens of the State at large. This principle also, has been adopted by the States which have recorded the greatest progress in highway development; but, in some States, it meets resistance arising out of the conception of local self-government and the limitation of local responsibility to the improvement of local conditions. There is actually no conflict with the institution of local self-government. On the contrary this principle recognizes what I take to be an axiom of political economy: That improvements which benefit equally more than one locality or government unit should not be held to be the obligations of any one locality. There is imposed upon them the burden of maintaining the 90 per cent

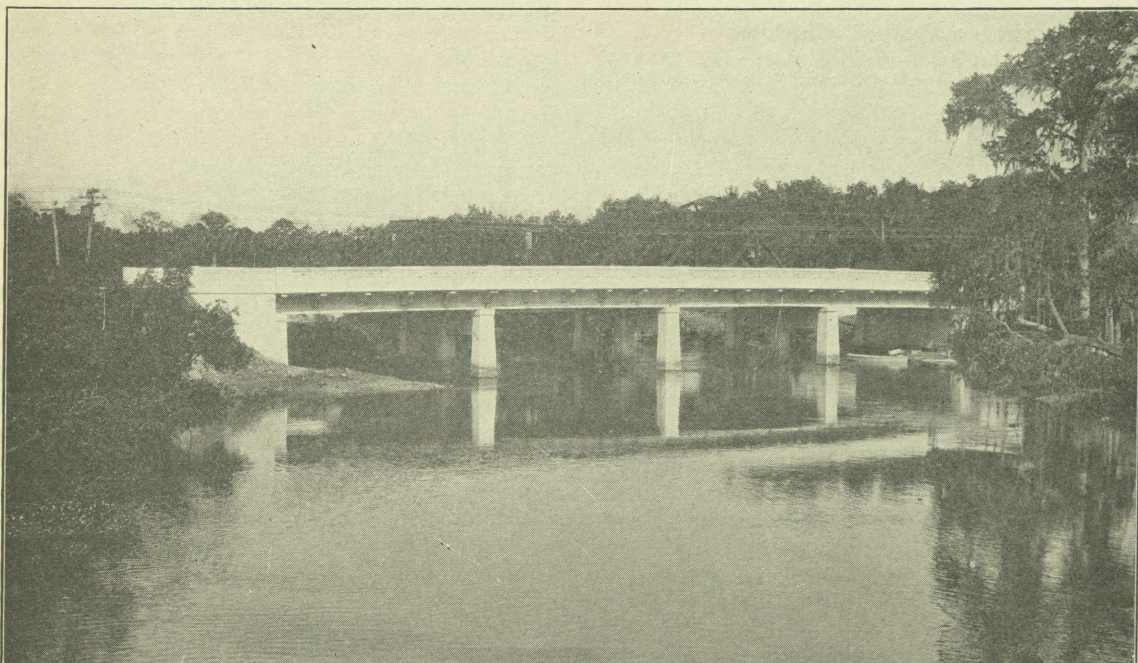
of all roads which are solely of local benefit. It is not right to expect them to build the main roads of the State which lie within their borders when, as is often the case, such roads afford greater service to communities outside of the county borders than to the county itself. It is not fair to exhaust the credit of the counties by expecting them to pay for roads the income from which will return only in part, in small part, perhaps, to their citizens.

State Must Build Main Roads

Let me illustrate my point by referring to a certain county I know of, a county situated in a valley, surrounded by mountains. In order to obtain an outlet it bonded itself to the very limit and spent every cent of the money on a main line of highway. Its money spent and its credit exhausted, this county now finds itself with a road running through the center of it, but with no connection on either end, and there is no possibility of making these connections unless the State takes over the responsibility. The road is really a part of the main highway in that part of the State and it is the State's duty to take it over, reimburse the county for the money spent and connect it with the adjoining counties. It is not fair to place this burden on the county. It is not fair.

This principle was not included in the original Federal Highway Act, and hereafter it will be required of every State as a condition precedent to the granting of aid by the Federal Government that the State shall provide funds under the control of its highway department to pay the State's part of the cost of constructing the Federal Aid roads and to maintain them perpetually when completed.

When, in recognition of these established principles, the highways have been classified according to



Hillsborough County. Beautiful Sulphur Springs Bridge over Hillsborough River, State Road Number Five

use and a State highway organization, provided with State funds, has been created to care for the construction of the State roads; when the individual counties have thus been freed of the burden of providing for the more expensive roads which are the concern of the entire State, the next problem is to determine the rate at which the improvement of all systems is to go forward, and in this there is involved directly the problem of financing the improvements.

Nothing Must Stop State System

But here let me say that there is this principle that may be set down as inevitable: That until a State has completed the back bone of its trunk line system with suitably paved or surfaced highways, the rate of construction should be independent of the source of the revenue or the method of payment, and should be limited only by the physical handicaps imposed by the available supply of labor and materials. Only by accepting this principle can the ultimate cost of the highways and their service be reduced. For the use of the principal highways is so extensive that the people pay for adequate highways whether they have them or not, and they pay less if they have them than if they have not. This statement can be very readily proved by considering the difference in the one item of fuel for motor vehicles on unimproved roads and improved roads.

Here is an example taken from an industrial section. The recent traffic counts made by the Bureau of Public Roads in Connecticut and Massachusetts, taken in October, which is an average traffic month, show an average traffic passing each of four stations of 1140 tons of commodities per day of nine hours. Adding one-third, as a very conservative estimate for the full day, we have 1520 gross tons daily commodity movement, which includes the weight of the commodity and the carrying vehicle. Now, from figures based on experiments conducted by the Iowa Experiment Station, assuming gasoline to cost 24 cents per gallon, the cost of fuel alone for moving this tonnage over an ordinary dirt road would be \$26.44 per mile per day, assuming the impossible, that such traffic could be carried over a dirt road. The cost of fuel for moving the same tonnage over a paved road would be \$11.70, a difference of \$14.74 per day. On the basis of 300 days per year the actual saving in fuel alone for moving this tonnage would be \$4,422. Suppose the paved highway costs \$40,000 per mile. The average interest at 5 per cent would be then \$1,000 per year, which, deducted from the saving of fuel, would leave a balance which would retire the cost of the road in a little over 11 years.

Here are the astonishing figures of the cost of an improved highway, constructed at prices which are above what we believe will be the general average of such costs, and the saving in fuel consumption alone on the commodity traffic is sufficient to pay the cost of the construction, and the tremendous passenger traffic is carried, on this basis, free of cost.

With such facts as these before us, I think it must be agreed that until the trunk line systems are completed there can be no debate as to the wisdom of providing money for their construction. The question is: Are we going to pay for highways and get

them or will we pay for them and not have them? There can be only one answer to that question.

Type of Improvement Varies

But I do not mean to say that all highways, even of the trunk line system, should be paved. The type of improvement required is clearly dependent upon the traffic, and if the traffic be known the kind of surfacing or pavement to be applied or whether to apply any surfacing at all will be a relatively simple matter to decide. It is merely a matter of balancing the aggregate saving in cost of operation, which is a product of the number of vehicles and the reduction in operating cost made possible by the various types of surface, against the costs of the several types of improvements. For any particular traffic density the economic type is that which can be paid for with the savings in operating cost accruing from the improvements. No road should be improved to an extent in excess of its earning capacity; but all roads should be developed to the highest degree consistent with the return in the form of traffic economics. Fortunately, we are not limited to any one type of improvement. Our problem is to provide economical transportation, and in doing so we must resort to every material and every practice that can be utilized to obtain the end desired.

Nor do I mean to imply that every highway should be brought at once to its final state of improvement. We must keep always in mind that the amount of construction possible in any State is necessarily restricted by the physical limits of labor and material available. But in some of the less advanced States there are miles upon miles of roads to be improved, and every mile in unimproved condition entails a reducible expense to the traffic that uses it.

Should Extend Mileage of Improved Roads

The ideal solution would be to improve all such roads at once, raising each to the state of improvement justified by its traffic, but this it is physically impossible to do. What, then, is the better course to pursue? To confine all attention to a few roads each year, leaving all others in a totally unimproved condition, or to extend the mileage treated and develop a whole system progressively by stages? We have learned by experience that the stage-improvement plan is the better and we have recognized the wisdom of it by advancing Federal Aid funds for improvements of this character.

There will be certain roads, of course, so important from the standpoint of traffic that they must be singled out for complete improvement at once, but generally speaking, the greater return will follow the simultaneous upbuilding of an entire system. In one State, with which I am very familiar the application of this method has made it possible to improve 1500 miles of secondary roads, surfaced with material available locally, which will last for a period of from five to ten years and will greatly facilitate traffic during this period on the entire mileage improved. If the same resources had been applied to the construction of paved roads they would have produced only some 150 to 200 miles of pavement and the balance of the mileage would remain entirely unimproved.

I think there is no question that the improvement



**Bathing Beauties? No!!
Hunters or Fishermen? No!!**

Merely one of the Department's
Locating Parties on the job.

The photographs on this page give a graphic idea of the difficulties and hardships encountered by the men in the field in their job of laying out and locating a State Road.



BASIC PRINCIPLES OF HIGHWAY MANAGEMENT AND FINANCE

(Continued from Page 8.)

of the trunk line system should be carried into effect as rapidly as physical limitations will permit, and I have said that this should be done regardless of the methods of financing adopted; but I do not mean to imply that I regard the methods of financing as unimportant.

Three Sources of Revenue

Let us consider briefly the principles of financing. In the first place, it seems to me that there are only three sources of revenue, and whatever money is needed must come from one or more of them. One is the road user, from whom revenue may be derived in the form of automobile license fees or a gasoline tax; the second is property—real or personal—on which a direct tax may be collected; and the third is income. Then there are just two methods of expending the money derived from these sources, either by the pay-as-you-go plan or the deferred payment plan, which means a bond issue. Now, it seems to me that it is entirely possible, by following certain well known principles to finance a progressive program of highway improvement which will be acceptable to all parties.

The first of these principles is this:

That the total cash expenditures, in each State, for highway purposes shall be considered as the annual highway budget.

We are building State roads and county roads and local roads, and the money to pay for all of them is derived from the same people. This being the case, unless we consider the financial needs of all classes of roads in preparing our highway budget, we are very apt to pile up an expense which it will be impossible to meet without excessive taxation.

Comprehensive Budgets Required

The business-like way to proceed is to recognize at the outset this first principle of successive financing, set up a comprehensive budget which will cover the work for the year on all classes of roads and which will be adjusted to the people's ability to pay.

For the purpose of securing efficiency all expenditures on all systems should be correlated under engineering and economic supervision; and the order, character and extent of the improvements made upon the several systems should depend upon the relative future traffic requirements. The attainment of these objects implies the creation of a budgetary authority to supervise all highway expenditures in the State, and such an authority should, in my opinion, be created.

There is this fact also that we must constantly bear in mind: That the expenditures for highways is only a portion of the necessary public expenditure. We cannot take all the income from public revenue and devote it to highways. There are educational institutions to be maintained and there are other public functions that require money for their proper performance; and it may, therefore, be taken as another fundamental principle that the annual highway budget should be adjusted to the relative needs for other public purposes.

Motor Funds Must Be Set Aside

The revenues derived from various sources must be sufficient to cover all these needs, and the portion allotted to highway improvement must not be out of proportion to the relative need for highways. But in this connection it should be added that all revenue secured from motor vehicles or road users should be set aside for highway purposes.

Now, if the highway program, planned and administered as I have described entails an expenditure greater than can be met with current funds without diverting money from other necessary purposes, the only resource is to issue bonds, for I will remind you again that to fail to prosecute the work of highway improvement as rapidly as physical limitations will permit is merely to shoulder the inescapable expense in the form of greater operating costs for vehicles, a form in which it will be greater than if it is assumed as a road construction cost.

Exactly what part of the cost of the program can properly be deferred is perhaps a debatable question. That is to say, there is a debatable middle ground where it is difficult to define the policy that may be pursued with propriety. There is no question that certain parts of the construction cost may be deferred without reasonable objection; for example, the costs of the grade and drainage structures which are practically permanent improvements. On the other hand there is no question that maintenance charges as they are ordinarily defined should not be met with borrowed money. But in between these two fixed points of policy there is doubtful ground wherein it is difficult to judge offhand as to the soundness of deferring payment.

Character of Maintenance Important

The principal doubt arises over the financing of the cost of the pavement; and it seems to me that the solution of this doubt rests entirely with the character of the maintenance. It is probably the merest platitude to say that unless the roads are maintained year by year—it matters not how well they are built—the investment in them will gradually be dissipated and the roads themselves will never give the service that they should be expected to give. Perfect maintenance, on the other hand, absolutely guarantees the integrity of the original investment, assures continuous service and converts what would otherwise be a liability into an asset.

The State of New York has been severely criticised by a great many people because it issued several years ago \$100,000,000 in bonds. Yet, I am convinced that the highways purchased with that borrowed money are now worth twice \$100,000,000 in actual replacement value. I think that is a very conservative statement; and, in addition, the people of the State have had the service of the roads all these years.

A lot of these roads are now being rebuilt, and it is true that the bonds issued have not been retired, but that does not mean that the people of the State will continue from now on to pay for an improvement that no longer exists, as has been erroneously stated. The grades remain intact, and much even of the surfacing material remains to form the basis of the renewed surface.

Old Surface Salvaged in Reconstruction

For example, on their macadam roads, originally surfaced twelve to fourteen feet in width, they are reshaping the surfacing material, drawing toward the center to form a strip 6 to 8 feet wide and adding an eight-foot strip of concrete on each side to form a pavement 22 to 24 feet wide and the cost of the finished construction has been just above the average cost of an 18 foot concrete road. So I repeat that whether you are to proceed on a pay-as-you-go policy or with funds derived from a bond issue is absolutely dependent upon the degree of protection you give the investment by maintenance.

Thus far I have not referred to the distribution of the financial burden, more than to suggest the sources from which the funds may be derived. I have preferred to deal with the problem in three distinct parts to avoid the confusion which arises when one undertakes to discuss methods of payment and sources of revenue at the same time. I have shown: first, that the trunk line system, at least, should be completed as rapidly as possible, regardless of the method of payment adopted or the sources from which the funds are obtained and that it should be limited only by the physical factors of labor and materials available; second, that the method of deferred payment is the logical resort when the funds necessary to carry on the requisite program are greater than may be obtained without undue burden from current tax collections.

Now I am going to add that these points of policy will remain unchanged regardless of the distribution of the cost. Whether funds are obtained by taxation of property or road users should not affect the rate of improvement (at least for trunk line roads) and it has nothing to do with the method of payment adopted. The decision as to whether to pay-as-you-go or defer the payment is dependent only upon the relation of the necessary rate of expenditure to the rate at which it is expedient to attempt to raise the money by taxation, regardless of the kind of taxation.

Cost Should Be Related to Benefit

Now, viewing the problem of raising money as a separate matter there is one very definite principle that will aid in determining upon a wise policy. Concisely stated, it is this: That the cost of building and maintaining an adequate system of highways should be distributed in equitable relation to the benefits derived.

I wish to develop this point very clearly and enumerate the various benefits derived because there is a tendency to saddle too much of the original cost of construction upon road users.

First and most important are the general benefits to society, such as the influences on education, recreation, health, the national defense, the postal service, living and distribution costs. In these, our general benefits, every man shares whether he rides in an automobile or not. Everyone remembers the absolutely indispensable part played by the highways during the war. It is self evident that the efficiency of the rural free delivery postal service is dependent absolutely upon the condition of the roads. No one is so out of touch with developments in modern educational methods as not to know that the progress of rural education depends upon the

displacement of the one-room school house by the centralized graded school and that this development in turn is dependent upon the improvement of the roads. The advantage of improved roads in making possible prompt medical attention in case of sickness is too well understood to be argued over; and so are the benefits that are derived by the former through increased participation in the facilities for recreation afforded by the town and the city and the general influence of the roads upon living distribution costs. It is only necessary to mention these benefits for every one to realize how great an influence they have upon the lives of all of us.

Special Benefits Numerous

A second important group is made up of the special benefits, such as those to agriculture, manufacture, labor, railroads, waterways, mining and forestry. Without roads there could be no agricultural development at all. Without roads there would be practically no freight for railroads and ships to transport. The need for roads to develop and protect our forests is so well understood that, as a nation, we are expending large sums of money for that special purpose. The advantage to manufacturers is two-fold—the roads facilitate the acquisition of raw material and aid in the distribution of the manufactured product. It is not necessary to go further in the development of the argument. It needs but a little reflection to convince one that every branch of industry is benefited directly because roads are built and maintained, and it follows that the economic improvement of the roads must increase these benefits.

The benefit to property is well understood, and the benefit to road user is direct and obvious.

Now I would add this: That all these benefits must be taken into consideration in making the assessment for the construction and maintenance of the roads. It is not fair to lay upon any one class a part of the cost disproportionate to the benefits it receives.

And I will go further and say that in voting for highway bonds, it is not wise to obligate all the money that can be derived by taxation of the road user to pay the interest charges and retire the bonds. Money will be needed to maintain the roads when they are built; and it is especially appropriate to devote the money raised by taxation of the road user to this purpose, for two reasons: First, because it will be raised in direct proportion to the use of the roads and therefore in proportion to the need for maintenance; and second, because, once the rate is fixed, the return will be automatic, thereby assuring a continuing source of revenue for maintenance which, to be effective, must be continuous.

Users' Funds Go First to Maintenance

I do not mean to say that no part of the revenue raised by taxation of the road user should be devoted to construction, but merely that from it there should first be set aside an amount sufficient to pay for maintenance and that the total revenue derived from this source should not be out of proportion to the benefits derived from the direct use of the roads. If a balance of such funds, fairly raised, remain after the maintenance requirements have been pro-

CHARLES M. UPHAM APPOINTED DIRECTOR OF ADVISORY BOARD ON HIGHWAY RESEARCH

Chas. M. Upham, State Highway Engineer of North Carolina, has been recently appointed director of the Advisory Board on Highway Research of the National Research Council, to succeed Dr. W. K. Hatt who resigned in order to resume his work at Purdue University.

The present board intends to continue the excellent plans already effected and to extend its activities so that the results of highway research may be practically applied by the States and counties carrying on programs of highway construction and maintenance and by others interested in highways. The organization has been extended so that each State highway department may have a representative on the board who will serve as a point of contact between it and the State. It is also planned to have similar representation from universities engaged in highway research.

Mr. Upham, the new director, has had extensive experience in highway work. He received his early training with the Massachusetts highway department and later became chief engineer of the Coleman du Pont Road in Delaware. Following this he was for four years chief engineer of the Delaware State Highway Department, when he was called to take charge of the extensive highway construction program in North Carolina. Mr. Upham holds a B. S. degree from Tufts College and an honorary C. E. degree from the University of North Carolina. He is an associate member of the American Society of Civil Engineers and holds active membership in

many other technical societies. For the past two years he has been business director of the American Road Builders' Association, and has been re-elected several times to his present position as secretary of the American Association of State Highway Officials.

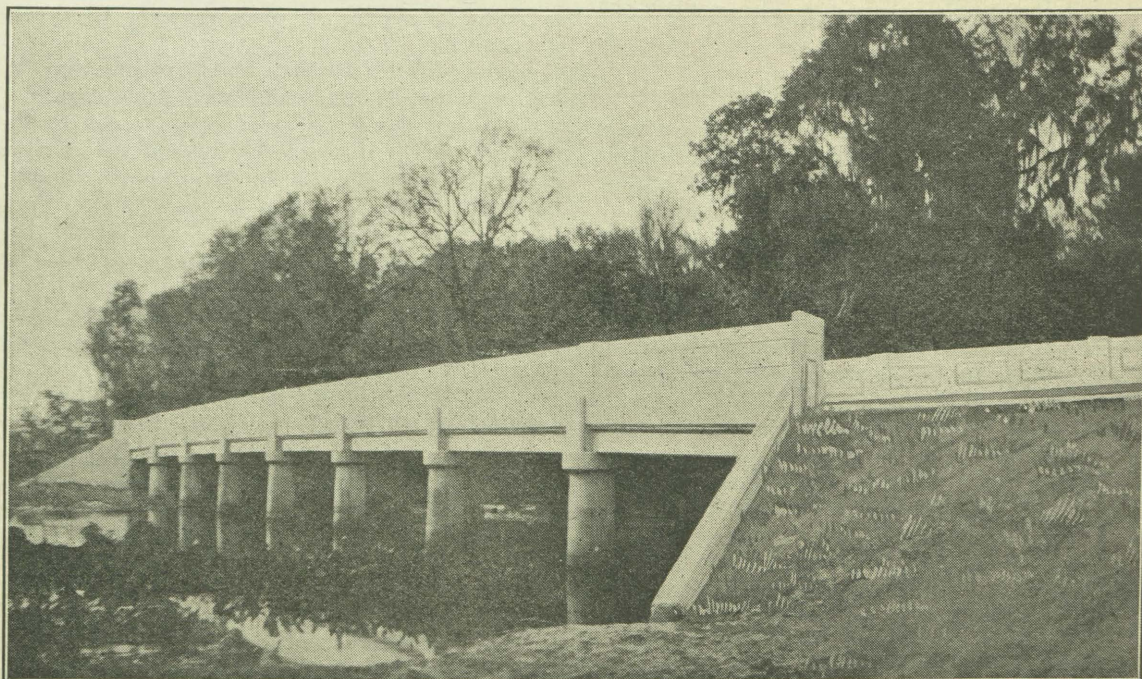
It is expected that Mr. Upham's wide acquaintance and broad experience in the highway field will make his connection as director of the Advisory Board on Highway Research especially valuable to those agencies which can utilize the information being made available by this organization.

The offices of the board are now located in the new and imposing building of the National Research Council at B and Twenty-first Streets, Washington, D. C.—Public Roads.

RECORD PERIOD IN ROAD BUILDING

If proof were necessary that the United States, which, thanks to the development of the motor vehicle, is now passing through the most intensive period of highway development in the history of the world, is building roads that surpass in quality anything of the kind constructed since the days of the Roman Empire, that proof is to be found in abundance.

It exists not only in the quality and quantity of American highways, but in the development of road building methods and materials. The road builders of this country have not only outstripped their ancient predecessors in the use of the most ancient materials, but are getting better results with greater speed, less labor and lower cost.—New York Tribune.



Federal Aid Project Number Twenty-nine, Hillsborough County.

Detouring Across the Continent

Uncle Henry Finds Lots of Signs of Scenery When He Tries to See America First

(Editor's Note—Through the generous courtesy of Collier's, the National Weekly, we are permitted to reprint the following story which appeared in its issue of August 9th, and which we believe our readers will agree is one of the most entertaining and amusing dissertations upon the delights of touring which has appeared in a long time):

My Dear Alonzo: I hope I don't need to remind you how I have always prided myself on being a 100 per cent American. I'm against war until there's a chance to fight, and I'm opposed to foreign entanglements except in the case of Swede cooks. I haven't voted for years, and within six months from the time a President is elected I'm searching my memory for new epithets to hurl at him. But when people talk about Seeing America First, what do they mean? How do they *do* it?

When you travel by train, a cinder invariably gets in your eye at every scenic crisis, or else a string of empty box cars bobs up just as you rush to the window to see some particularly notorious view. Even if you escape cinders and "empties," there are always sign boards. If one more cigarette is put on the market, Pike's Peak and the Washington Monument will be about the only things that won't be entirely hidden.

Worse Than a Stalled Ox

Touring in an automobile isn't much better so far as seeing the rocks and rills and templed hills that figure in the famous song that every true American is always on the point of learning. We've been on the road four days now, and each evening finds my nose so firmly rooted in the Blue Book that they have to use a jack to get me ready for bed. Whatever effect this trip may have on my general health, it has certainly done my astigmatism a world of good. You never saw anything develop more rapidly, each day seeming to give it new strength and enthusiasm. I'm writing to the National Automobile Association to suggest "More and Better Astigmatisms" as a slogan.

There was a time when I had a feeling of pity for those poor pioneers who crossed the plains in the gold rush of '49, but now I think of them with an almost passionate envy. All they had to do was to point their faces to the setting sun and keep going until they stubbed their toes against the Rockies. They didn't have to worry about the right turn at the courthouse, the left fork at the cemetery, or the problems presented by 4-cor. left along fence or 26.3, large upright pipe on left, right, keep straight ahead 28.4, jog left, right across bridge, left 1 blk. to lumber yard, bear right 119.7. Oxen may have been slow, but you never had to take off their horns to hunt for ignition trouble or crawl under them to study their differentials.

Until this trip I was firmly of the opinion that automobile construction had been carried to the highest possible pitch of perfection. I can't recall an advertisement that showed a car in anything but rapid motion, and as I looked at the pictures of happy families lolling luxuriously on soft cush-

ioned seats while the scenery sped by, it seemed to me that the last word in comfort had been spoken. But now I know better. Where they ought to put the soft cushions and cigar lighters is under the car.

When we started on this trip, I thought it was going to be a great chance to get acquainted with my son, but all I've ever seen of him is his legs. We talk a lot about eyes, but I don't know of anything more eloquent than a pair of legs protruding from under a car. Sometimes they speak so plainly that I won't even let my wife look.

The comforts and conveniences of an automobile ought to be put where they can be used. What good are mirrors, flower holders, saddle bag seats, and ash trays on top of the car? They ought to be down among the snubbers, differentials, and transmissions, where a man spends most of his time. If I ever go into the automobile business, I'll sweep the field with a car that has a hammock swung from axle to axle, with head rests every few feet, and reading lamps scattered around.

But don't understand me as knocking the automobile, 'Lonzo. Whatever its weaknesses, it has a pride and self-restraint that we human beings might do well to imitate. Never by any chance does one break down in public or expose its ailments to the callous gaze of the crowd. It may be suffering the torments of the damned from its carburetor, or be on the point of dissolution from hardening of the valves, varicose veins, or auto-intoxication, but with iron courage it will manage to stagger along until every evidence of civilization has been left far behind. Only when satisfied that there is not a garage within ten miles does it yield to weakness and give up the struggle.

The Noisy Caterpillar

Don't talk to me about the silence of the grave. There's no stillness like that produced by an automobile when its breaks down. The hush that falls is so profound that the creep of a caterpillar ten miles away beats on your ear drums with unbearable violence. The dreadful quiet communicates itself to all nature, and there comes a horrible feeling that everything in the world has stopped. As you sit on the roadside, staring at the silent, motionless mass, you can't remember that it ever did move. You shut your eyes, and try to call up pictures of the time when it roared and raced, but memory and imagination both fail.

I'm sorry not to be able to write about the roads, as you asked, but so far our travel has been on detours. Never again will I be guilty of saying that there are no ideals of public service in America, for the way these destruction gangs work is an object lesson in zeal and indefatigability. Time after time, from the tops of hills, we've seen fair stretches of concrete in the distance, and it didn't seem possible that anything could be done to them before we got there. Yet when we reached the spot the road would

be torn to pieces, a detour sign all painted and hung, and under the shade of near-by trees one could see the industrious workers hard at work recuperating from their frenzied efforts. You know what I've always said about golf courses. Why spend money in the fairways when 90 per cent of players are never near them? It's the rough that ought to be improved. Same way with roads. Why devote millions to them when nobody ever gets on one?

Neither am I able to give you the desired information about Kansas. To tell you the truth, 'Lonzo, what with trying to decide whether I was on the Golden Belt Highway, the Victory Highway, the Pike's Peak Ocean to Ocean Highway, the Union Pacific Highway, the Victory Highway, the Midland Trail, the National Old Trail, or the Sante Fe Trail, and missing a left fork at the church coming out of some town at 78.2, I never knew we were in the State until I tried to buy some cigarettes. When the man told me it was against the law to sell them, I knew then I was in Kansas all right enough. And when he leaned forward and whispered that he knew where I could buy some from a bootlegger, assurance was made doubly sure.

It's hard to keep track of States when you're motoring. Everybody starts out to take it slow and easy, but after you've spent the forenoon changing tires or trying to find out why they call it a self-starter, the afternoon finds you feverishly willing to break every speed law. I don't suppose I would have known that we were in Colorado but for a near tragedy that happened soon after we crossed the border. As we were bowling along between pun-

tures, we heard screams for help and, rushing to where they came from, discovered that two men had fallen into a river and were smothering to death. Colorado is mighty careless with its rivers. Twice we saw streams that were still damp, somebody having left them out overnight so that they got rained

Folks Follow the Food

I may as well tell you now that all of my worst fears with respect to country hotels have been confirmed. In the heart of the dairy district, where cream ought to be so thick it takes two men to push it out of the pitcher, all you get is a blue trickle that makes you grab to see if your fountain pen is leaking. As for fresh vegetables, they never hear of them unless they read the city papers. I know now why so many people are leaving the country—they're following the food.

There's one thing, though, that you've got to give them credit for. No matter how poor the hotel every other way, its acoustics are always such as to excite the envy of any opera house in the world. Whether it be the whistle of a locomotive, the bay of a dog, the mating call of a Ford, the gay laughter back of the prescription counter at the drug store, every noise is reproduced and magnified by the walls of your room until you feel like the inmate of a microphone. When I get through this trip, I'm going to New York for a quiet night's sleep. I'll write again if my strength holds out.

HENRY.

P. S.—If ever you are tempted to think me less than a true friend, kindly recall that I have not sent you a single picture postal.

EXPLOSIVES IN ROAD CONSTRUCTION

Estimates made in connection with the various road building programs throughout the country show that approximately 1000 pounds of explosives are required in the construction of each mile of new roads. These explosives are dynamite and blasting powder. They are used for blasting stone from the quarries, for clearing out obstructions in the right of way and for drainage purposes.

The quarries in the United States use in the neighborhood of 60,000,000 pounds of explosives a year and about half the material obtained goes for road work. On an average, three tons of stone are moved per pound of dynamite. Explosives manufacturers have also developed a system of shooting electrically which adds to the efficiency and safety in the use of high explosives and has been responsible for saving much time in road construction.—Highway Engineer and Contractor.

Eighteen million pounds of sodatol, a surplus war explosive, is to be distributed by the U. S. Bureau of Public Roads for road building and land clearing purposes. The new supply of explosive is very similar to dynamite and picric acid, 12,000,000 pounds of the latter having already been distributed to road builders and farmers.—Ex.

Did you ever know that there are 15,201,000 telephones in the United States and 15,221,183 automobiles? In 1920 there were 2,000,000 more telephones than automobiles.—Ex.

Economy

It will cost a billion dollars to abolish the grade crossings in America, but it would cost far more than that to abolish the kind of people who get hurt on them.—Ex.

THE ROAD HOME

By Oliver Allstorm

Best is the short road;
The short road is best;
The best road leads homeward
To love and to rest.
Long is the strange road;
The strange road is long;
The long road seems endless
And empty of song.
Bright is the best road;
The best road is bright;
The bright road leads homeward
To comfort and light.
Cold is the long road;
The long road is cold;
The cold road is lonely
And far from the fold.
Sweet is the bright road;
The bright road is sweet;
The sweet road is tender
To world-weary feet.
So give me the short road;
It leads to the gate
Where love calls me early,
Yet welcomes me late.

—Texas Highway Bulletin.



Florida Abounds in Such Scenes of Tropical Beauty. Crystal Springs, Pasco County.

Transactions of the State Road Department at its Quarterly Meeting

The State Road Department held its third quarterly meeting in the offices of the Department at Tallahassee, July 26th, 1924, with Judge Philips, Mr. Corry, Mr. Schilling and Mr. Green present; Capt. Hillman was absent, having been too ill to remain for the convening of the meeting.

Mr. J. L. Cresap, State Highway Engineer, Judge B. A. Meginniss, Attorney for the Department, and Ella Creary Thompson, Secretary, were also in attendance.

The minutes of the last meeting of the Department were read and, upon motion, approved.

The report of the Chairman was read, approved and ordered filed.

The Chairman reported the following contracts awarded, the vote of the members on same having been received by mail:

Project 37-D, Road No. 2, Alachua County.—Bridges across Payne's Prairie; awarded to C. T. Dawkins, Jacksonville, at the price submitted in his proposal for same.

Project 622, Road No. 2, Lake County.—Paving; awarded to Southern Paving Construction Company, Chattanooga, Tennessee, at the price submitted in their proposal for same.

Project 44, Road No. 2, Lake County.—Paving; awarded to Southern Paving Construction Company,

Chattanooga, Tennessee, at the price submitted in their proposal for same.

Project 564-B, Road No. 5, Charlotte County.—Timber bridges; awarded to Boone and Wester, Punta Gorda, Florida, at the price submitted in their proposal for same.

Project 625, Road No. 5, Citrus County.—Clearing, grading, drainage structures, rock base; awarded to Barber-Fortin Company, Jacksonville, Florida, at the price submitted in their proposal for same.

Project 626, Road No. 5, Citrus County.—Clearing, grading, drainage structures, rock base; awarded to Barber-Fortin Company, Jacksonville, Florida, at the price submitted in their proposal for same.

Project 582, Road No. 8, Highlands-Okeechobee Counties.—Bridge over Kissimmee river; awarded to W. J. Conners, West Palm Beach, Florida, at the price submitted in his proposal for same.

Project 562-A, Road No. 8, Highlands County.—Sug-grade and base; awarded to Weeks and Jackson, Tampa, Florida, at the price submitted in their proposal for same.

Project 629, Road No. 8, Highlands County.—Rock base; awarded to Mickler and McLeod, Tampa, Florida, at the price submitted in their proposal for same.

Project 630, Road No. 8, Highlands County.—Marl surface; awarded to Meyer Construction Co., West Palm Beach, Florida, at the price submitted in their proposal for same.

Project 534, Road No. 24, Brevard County.—Two timber bridges; awarded to Ed Pettus, Ramer, Alabama, at the price submitted in his proposal for same.

Project 601, Road No. 3, St. Johns County.—Three timber bridges; awarded to Ed Pettus, Ramer, Alabama, at the price submitted in his proposal for same.

Upon motion of Mr. Schilling, seconded by Mr. Corry, the following resolution was adopted:

Resolved: That the action of the Chairman in awarding the above contracts is hereby ratified and confirmed.

St. Lucie County—Road No. 8.

Upon motion of Mr. Schilling, seconded by Mr. Corry, the following resolution was adopted:

Whereas, Bids were asked for the construction of a rock base on a portion of Road No. 8 in St. Lucie County, and upon canvassing the bids received, it was found that the one submitted by C. F. Lytle, of Jacksonville, was lowest; Now, therefore, be it

Resolved, That the Chairman be and he is hereby authorized to enter into a contract for the construction of a rock base on what is known as Project 636, St. Lucie County, a portion of Road No. 8, Provided, St. Lucie County turns over to the Department the funds appropriated by the county to aid in the construction of this section of road, the work to be done as soon as these funds are received.

Project 39-B.—St. Lucie-Brevard Counties.

Upon motion of Mr. Schilling, seconded by Mr. Corry, the following resolution was adopted:

Whereas, Bids were asked for the construction of the bridge approach fill to Sebastian River Bridge, St. Lucie-Brevard Counties, on Road No. 4, and upon canvassing the bids received, it was found that the one submitted by Waldeck-Deal Company, Miami, was lowest; Now, therefore, be it

Resolved, That the Chairman be and he is hereby authorized to enter into a contract with Waldeck-Deal Company, Miami, for the construction of above fill, at the price submitted in their bid.

Escambia Bay Bridge—Road No. 1.

The following resolution was duly adopted:

Resolved, That the Chairman be and he is hereby authorized to advertise for bids for the construction of a bridge across Escambia Bay, between Escambia and Santa Rosa Counties, and

Be it further Resolved, That advertisement be made immediately upon Escambia County authorities depositing with the State Road Department the \$50,000 appropriated by said county to aid in the construction of the Escambia Bay bridge.

St. Marys River Bridge—Road No. 3.

Upon motion of Mr. Corry, seconded by Mr. Schilling, the following resolution was adopted:

Whereas, Representatives of the Bureau of Public Roads, the Georgia and Florida Highway authorities, have met and made an inspection of several proposed sites for the bridge to be constructed across the St. Marys River at Wilds Landing on Road No. 3, Nassau County, and

Whereas, The Georgia authorities have submitted to this Department a proposition in writing for the

handling of this project, as well as the construction of a bridge across said river near Folkston; Now, therefore, be it

Resolved, That the Chairman be and he is hereby authorized to enter into such agreement with the Georgia authorities as will terminate and result in the construction of said two named interstate bridges on the basis of the proposal of said Georgia Highway Department.

St. Marys River Bridge—Road No. 3.

Upon motion of Mr. Corry, seconded by Mr. Schilling, the following resolution was adopted:

Resolved, That the Chairman of the State Road Department be and he is hereby authorized and directed without further reference to this body, to prepare plans for the construction of a concrete and steel bridge across St. Marys River on State Road No. 3, at or near Wild's Landing, between Kingsland, Georgia, and Gross, Florida, and to make application to the War Department for the necessary approval.

Brevard County—Road No. 18.

The following resolution was duly adopted:

Resolved, That the Chairman of the State Road Department be, and he is hereby authorized and instructed to enter into a contract for the construction of a creosoted timber bridge across the St. Johns River on State Road No. 18, between Melbourne and Kissimmee, said work to begin at the earliest date possible, and

Be it further Resolved, That the sum of \$27,000 is hereby appropriated for the construction of said bridge.

Alachua County.

Upon motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Resolved, That the Chairman of this Department be, and he is hereby authorized to enter into an agreement in the name of the State Road Department, as follows:

"At the request of the Board of County Commissioners of Alachua County, Florida, consent is hereby given to Special Road and Bridge Districts Nos. 2 and 3, to construct, respectively, a highway on the line of State Road No. 5 within their respective limits, as that road is set forth in Chapter 9311, Acts of Florida, 1923, and more definitely located by the State Road Department in accordance with the map attached hereto and marked Exhibit A, such construction being in accordance with the specifications likewise attached hereto and marked Exhibit B, and to make contracts for such construction.

The consent herein granted is subject to the further condition that 30 days before any contract shall be let for all or any part of such construction, notice of intention to make such contract shall have been served upon the Chairman or Secretary of the State Road Department, which reserves the right during such thirty day period to withdraw the consent hereby granted provided, however, that such consent shall not be withdrawn unless, at the same time, the State Road Department shall be willing to execute an agreement with your body under Chapter 8553, Acts of 1921, for the construction of said roads in accordance with the specifications hereto attached

and marked Exhibit C, and to accept the proceeds of the bonds voted by said districts, being \$120,000 bonds voted by District 2 and \$70,000 bonds voted by District 3, or so much or such part thereof as may be necessary to meet State Aid, to be furnished by the said districts, respectively, to the construction of said roads by the State under such specifications."

DeSoto and Highlands Counties.

Upon motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Whereas, This Department did in 1919, enter into an agreement with DeSoto County to expend the sum of \$100,000.00 on State Aid Road No. 7 in DeSoto County east of Dorr Field (now a part of State Road No. 18, as well as a part of State Road No. 8), said sum to be used in conjunction with \$67,500.00 of county or district funds, and

Whereas, Said sum of \$67,500.00 of bond funds of Special Road District No. 6 was actually expended on said road as above described under the supervision of this Department, and

Whereas, The Department is advised by its attorney that said agreement is a valid and binding contract on the Department within the meaning of Chapter 9311, Laws of Florida, 1923; Now, therefore, be it

Resolved, That the State Road Department does hereby recognize the said contract as valid and binding, and does agree that it will appropriate out of its funds available in 1925, the sum of \$100,000.00 to be expended on said State Road No. 18 between the western boundary of Highlands County and State Road No. 8 at Lake Annie, said Highlands County being a portion of DeSoto County as it existed at the time of said agreement, and said portion of said Road No. 18 between the western boundary of said Highlands County and State Road No. 8 at Lake Annie, being the portion of said road improvement of which was contemplated by said contract.

Lake County.

Upon motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Whereas, This Department has found and determined and does hereby find and determine that it is necessary, wise and expedient to secure by eminent domain the real estate hereinafter described for the purpose of a right-of-way for State Road No. 2 in what is known as part of subdivision known as "Dream Lake," Fruitland Park, in Lake County, Florida, and

Whereas, There has been prepared and submitted a map or plat of said part of said subdivision which shows in detail the property necessary to be acquired for such right-of-way for State Road No. 2, which said map or plat is marked and designated as follows: "Plat showing location of Lots Nos. 19 and 20, property of E. D. Cameron, part of subdivision known as 'Dream Lake,' a subdivision of the east ½ of N. E. ¼ Sec. 9, T. 19 S., R. 24 E., Fruitland Park, Florida, as affects the location of State Road No. 2, F. A. Project No. 44, Sta. 405+85 to 407+21.9"; Now, therefore, be it

Resolved by the State Road Department, That the said map or plat be and the same is hereby

approved and adopted as the survey of this Department showing and designating the location of said Road No. 2 through said part of said subdivision.

Be it further Resolved, That that property hereinafter described is hereby authorized to be acquired by the State Road Department for the uses and purposes hereinabove set forth, which said property is owned by one E. D. Cameron and is particularly described as follows, to-wit:

That part of Lots 19 and 20 lying east of clay road of Dream Lake Subdivision in east ½ of N. E. ¼ of Sec. 9, Tp. 19 S., R. 24 E., in Fruitland Park, Florida, described as follows:

Beginning at a point one hundred twenty-one and eighty-six one hundredths feet (121.86') from N. E. corner of above described lot; run thence along north boundary of Lot 19, fifty-four feet (54'); thence along west boundary of Lots 19 and 20, one hundred feet (100'); thence in a southerly direction along west R. W. line of State Road No. 2, forty-six feet (46'); thence along south boundary of Lot 20 in easterly direction seventy-two feet (72'); thence in northerly direction along east R. W. line of State Road No. 2, one hundred thirty feet (130') to point of beginning. Containing twenty-four one hundredths of an acre, more or less.

The estate in said property hereby authorized to be acquired is an estate in absolute fee-simple.

Be it further Resolved, That all proper and necessary proceedings for the acquiring of the above described property by such eminent domain are hereby authorized and the Chairman of the State Road Department and its Attorney are hereby authorized to prepare and sign all necessary pleadings and affidavits, and to take all necessary steps and actions required by the statutes of the State of Florida in such cases.

Lake County.

Upon motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Resolved, That the State Road Department does hereby agree that if Lake County will expend the sum of \$25,000 per mile on Road No. 2 from Leesburg to Helena Run, a distance of 3½ miles, in said County, under the supervision of this Department, that the Department will complete said portion of said road, and

Be it further Resolved, That the Chairman be and he is hereby authorized to enter into such contract with Lake County as to carry out the provisions of this resolution.

Marion County.

Upon motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Whereas, The authorities of Marion County are desirous of placing the road from Ocala to the Forest Reserve in the Federal Seven Percent System; Now, therefore, be it

Resolved, That the Bureau of Public Roads be requested to place the road in Marion County from Ocala to the Forest Reserve in that county, a distance of twenty miles, in the Federal Seven Percent System of Florida.

St. Johns County—Deep Creek Bridge.

Upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted:

Resolved, That the Chairman of the State Road Department be and he is hereby authorized and directed without further reference to this body, to prepare plans for the construction of a creosoted timber bridge across Deep Creek on State Road No. 4, between St. Augustine and Hastings, in St. Johns County, Florida, at approximately the same site as now occupied by the present bridge across Deep Creek, and to make application to the War Department for the necessary approval.

Volusia County—Road No. 4.

Upon motion of Mr. Schilling, seconded by Mr. Corry, the following resolution was adopted:

Resolved, That the State Road Department does hereby agree that if Volusia County will expend the sum of \$100,000 on Road No. 4 from the end of the brick road south of DeLand to the St. Johns River, a distance of ten miles, in said County, under the supervision of this Department, that the Department will complete said portion of said road, and

Be it further Resolved, That the Chairman be and he is hereby authorized to enter into such contract with Volusia County as to carry out the provisions of this resolution.

Palm Beach County—Road No. 4.

Upon motion of Mr. Schilling, seconded by Mr. Corry, the following resolution was adopted:

Resolved, The Department does hereby agree to construct a bridge across the Loxahatchee River near Jupiter on State Road 4 in Palm Beach County, provided, the County will turn over to the Department the sum of \$40,000.00; work to begin as soon as plans and surveys can be made for the bridge.

Tamiami Trail.

Upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted:

Resolved, That the Chairman is hereby authorized to have a survey made for the location of the Tamiami Trail, this survey to be commenced not later than October 1, 1924.

Jefferson County.

A large delegation of citizens of Jefferson County appeared before the Department requesting that the road leading from Monticello to the Georgia line be placed in the Seven Percent Federal System; and upon motion of Mr. Corry the following resolution was offered:

Resolved, That the Chairman be authorized to take such steps with the Bureau of Public Roads as to request that Road No. 11 leading from Monticello to the Georgia line be placed on the Federal Seven Percent System of Florida.

The above motion failed for want of a second.

Franklin County.

A delegation from Franklin County appeared before the Department in regard to surfacing material for use on Road No. 10, in Franklin County, between Carrabelle and the Ocklocknee River, and upon motion duly seconded and carried, the matter was referred to the Chairman and State Highway Engineer for decision.

Washington County—Road No. 1.

A delegation from Washington County requested the Department to let a contract for the construction of that portion of Road No. 1 in said county east of Chipley.

Upon motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Resolved, That the authorities of Washington County be informed that it is not practicable for the Department to comply with the request of said county at this time.

Walton County.

A delegation from Walton County appeared before the Department requesting that a hard surface be placed on that portion of Road No. 1, which runs through the City of DeFuniak Springs, as the Department is now working near this point.

The Department informed the delegation that the Department could not comply with the request that hard surfacing be placed on the street running through DeFuniak Springs, which will be a portion of Road No. 1, as the type of construction of said road is sand-clay and the Department is not in position to hard surface through the city.

The expense accounts of the members were approved and upon motion, duly carried, same are ordered paid.

There being no further business the Department adjourned.

U. S. Gains 1,943,000 Population in Year

The population of the United States totaled 112,826,000 on Jan. 1, 1924, according to estimates announced today by the National Bureau of Economic Research, Inc. This compares with 110,883,000 on Jan. 1, 1923, and the census count of 105,711,000 on Jan. 1, 1920. The most remarkable gain was recorded in the last half of 1923, the net increase being 1,162,000, a growth greater than in any other half year during the last two decades, and probably greater than in any six months period in the nation's history. The gain for the entire year was 1,943,000.—Ex.

Road Vehicles in Great Britain

In 1922 979,000 motor vehicle licenses and 237,342 horse drawn vehicle licenses were granted in Great Britain. The total receipts for these licenses was about \$55,000,000 all of which was expended for road betterment.—Ex.

More than 4,500,000 autos and trucks are owned on farms.

Put it Over.

We may

Look it over,

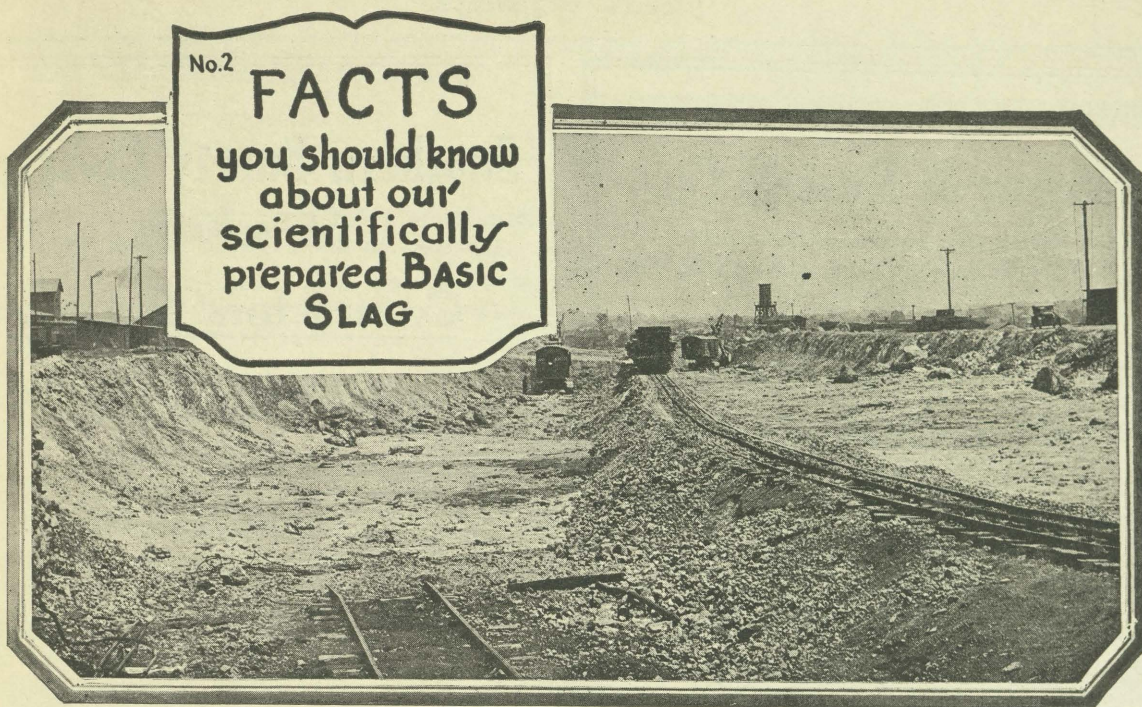
Think it over,

Read it over,

Talk it over,

But we shall be judged entirely by our ability to put it over.

—Dallas News.



No.2

FACTS
you should know
about our
scientifically
prepared **BASIC**
SLAG

To prolong the annealing process—and to make the Slag thicker and tougher—it is poured into Modified Pits

Under the old method, still used by a few producers, the Slag was poured over high banks and allowed to run down by gravity to a feather's edge. The thin strata cooled quickly and, when crushed, the Slag was too friable and there was an excessive percentage of flat, elongated pieces.

The modern scientific way of pouring Slag into modified pits enables us to definitely control the thickness of the strata—and to prolong the cooling and annealing process.

How exactly does that improve the product?

When Slag is poured in thick strata, it breaks up in much more **cubical** pieces when

excavated by the powerful electric shovels and run through the big gyratory crushers.

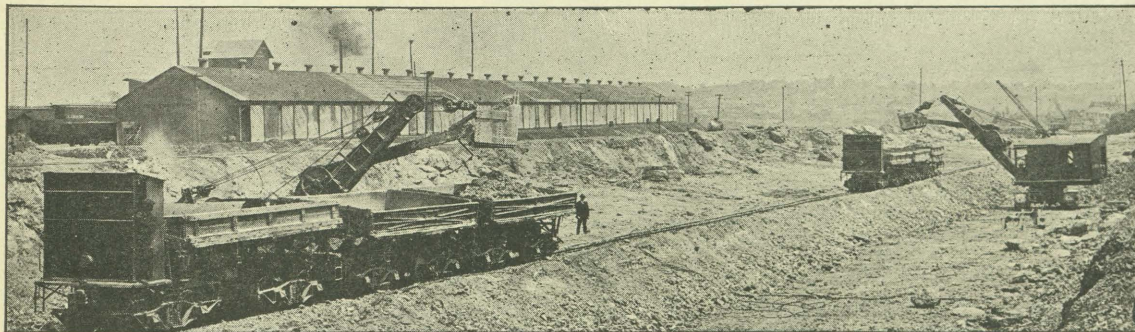
You steady users of slag "aggregate" know how important that is. Also you know from experience that when Slag is cooled slowly there is a marked increase in its solidity, toughness and strength.

"What happens after the Slag leaves the modified pits" is the subject of our next statement. Watch for it!

Birmingham Slag Co.

Slag Headquarters for the South

ATLANTA BIRMINGHAM THOMASVILLE



The five modified pits are dry canals about 15 ft. deep and several thousand feet long. Photo shows our two big electric shovels excavating the slag from the pits and loading onto dump cars drawn by electric locomotives over a third rail system to the crushing plant.

Wood Preservers Since 1878

Eppinger & Russell Co.

Main Office: 165 Broadway, New York
Branch Office: Buckman Building, Jacksonville, Fla.

CREOSOTED

Forest Products of all kinds

Works at Jacksonville, Florida, and
Long Island City, New York

Capacity
100,000,000 Feet, Board Measure,
Per Annum

Also Manufacturers and Dealers in
Untreated Yellow Pine and Cypress
Products of All Kinds

Information and Quotations Cheerfully Given.
Address Nearest Office.

Southern Surety Company

of Des Moines

Contractors' Bid and Performance Bonds

Agents throughout Florida.

Surety requests expeditiously
handled by

Harry F. Fromme & Co.

General Agents

Jacksonville and Tampa
Florida

Contracts Awarded by State Road Department from January 1, 1924, to August 12, 1924

Contractor	Proj. No.	County	Length Miles	Length Feet	Contract Cost + 10%	Type
Bryson Const. Co.....	598-A	Jefferson	9.45		\$93,169.29	Sand-clay
Edgar Chapman	564-A	Charlotte.....	10.885		92,390.03	G. & D.
L. M. Gray.....	572	Bradford.....	7.00		96,765.59	Rock
L. M. Gray.....	607	Bradford.....	5.10		70,679.12	Rock
L. M. Gray.....	594	Bradford.....	9.10		117,132.35	Rock
Ed. Pettus	563	Osceola.....		315	12,062.60	Bridges
J. J. Johnston.....	562-A	Highlands.....		375	11,556.60	Bridges
Higgins Const. Co.....	36-A	St. Lucie.....		72	16,322.04	Conc. Bridge
Higgins Const. Co.....	620	St. Lucie.....		45	3,672.90	Timber Bridge
Boone & Wester.....	564-B	Charlotte.....		105	11,004.40	Timber Bridge
C. T. Dawkins.....	37-D	Alachua.....		60	31,552.40	Conc. Bridge
Ocala Lime Rock.....	575	Putnam.....	5.46		39,688.00	Rock
Boone & Wester.....	564-B	Charlotte.....	9.54		73,276.28	Surf.
Sou. Pav. & Const. Co....	44	Lake.....	10.529		395,611.38	Bit. Conc. Sur.
Barber-Fortin Co.....	625	Citrus.....	10.86		195,328.35	Rock
Barber-Fortin Co.....	626	Citrus.....	6.61		106,155.48	Rock
Sou. Pav. & Const. Co....	622	Lake.....	.215		8,217.80	Bit. Conc. Sur.
W. J. Conners.....	582	Okeechobee.....		3,122	177,941.61	Conc. & Steel
Weeks & Jackson.....	562-A	Highlands.....	5.37		29,110.62	Bartow Clay
Mickler & McLeod.....	629	Highlands.....	6.00		40,270.23	Bartow Clay
Myers Const. Co.....	630	Highlands.....	11.00		50,356.46	Marl
Ed Pettus	534	Brevard.....		765	28,846.40	Timber Bridge
Ed Pettus	601	St. Johns.....		480	22,994.18	Timber Bridge
			107.12	5,339	\$1,724,104.11	

TEN GOOD COMMANDMENTS

1. Drive on the right side of the road; it is just as good as the left.
2. Slow down when approaching a cross road; it is nearly as dangerous as a railroad crossing.
3. Look out for children. You can never tell what they will do, and you are always in the wrong if you hit one.
4. Try to help instead of hindering the traffic officer; he is there for your good and he's got a tough job.
5. Be sure that your lights are not defective or glaring; it's no joke driving into a blinding glare, as you yourself know.
6. Read and obey the warning signs; they are not put up as ornaments.
7. If you've got to speed—do it where it won't kill anybody but yourself.
8. When making minor repairs get all wheels off the pavement and stop where your car may be seen from both directions; otherwise you may stop longer than you anticipate.
9. Speeding around corners is a straight route to the hospital. Don't race past a stopped car. Some day the jury will call it manslaughter.
10. Use discretion. The fact that you had the right-of-way won't bring anybody back to life, least of all yourself.—New Hampshire Highways.



“ON THE JOB”

Your biggest problem is keeping men and mixers busy. That's where we can help. When you use *Arrowhead* aggregates you can bank on

“on time deliveries”

for our modern plant, electrically operated throughout, has a daily capacity of 4000 tons of washed, screened, sized SAND and GRAVEL. And the long arm of *Arrowhead* service reaches to all points in the Southeast.

MONTGOMERY GRAVEL CO.
 Plant 4000 Tons Daily Shepherd Bldg.
 ARROWHEAD, ALA. MONTGOMERY, ALA.

*Permanent
roads are a
good investment
—not an expense*

How the Motor Industry Set the Pace for Highway Building

The “horseless carriage” of yesterday is now being produced as the modern automobile at the rate of 4,000,000 a year. The total number of motor vehicles registered in the United States is over 16,000,000.

And every automobile produced to-day is a good automobile, economically serving business and recreation needs of people in every station of life.

But there is an obstacle standing in the way of its maximum service to owners.

For while the automobile industry made paved highways an economic necessity, the mileage of such roads is today years behind the requirements of modern traffic.

Happily motorists everywhere are boosting for more and wider paved highways.

And extensive experience has taught them that Concrete Highways are one of the best all-around investments they can make—an investment that pays big dividends.

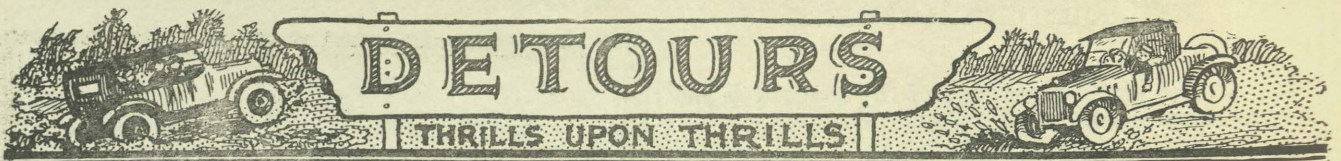
As one of our 16,000,000 motorists you know better than anyone else the need for more and wider Concrete Roads. Start now to help your local officials provide them.

PORTLAND CEMENT ASSOCIATION

Graham Building
JACKSONVILLE, FLA.

*A National Organization to Improve and
Extend the Uses of Concrete*

OFFICES IN 29 CITIES



How He Did It

We have just learned of an engineer who started poor twenty-one years ago, and has retired with the comfortable fortune of fifty thousand dollars. This was acquired through industry, economy, conscientious effort, indomitable perseverance, and the death of an uncle who left him an estate valued at \$49,999.50.—Seneca Vocational School.

Tough on Sister

Visitor (at private hospital)—Can I see Lieutenant Barker, please?

Matron—We do not allow ordinary visiting. May I ask if you're a relative?

Visitor (boldly)—Oh, yes! I'm his sister.

Matron—Well, well! I'm very glad to meet you. I'm his mother.—Rotary Round Table.

Mary—"I suppose your father will be all unstrung when he hears about your exams."

Jack—"No, I wired him last night."—Jester.

"The next person who interrupts the proceedings will be sent home," said the judge.

"Hurrah!" said the prisoner.—Ex.

Safety First

"Come right on in, Sambo," the farmer called out. "He won't hurt you, you know a barking dog never bites."

"Sure, boss, ah knows dat," replied the cautious colored man, "but ah don't know how soon he's goin ter stop barking."—American Boy.

The advisability of passing a car at a curve depends upon whether the widow will think the loss covered by insurance.—Fairmont (Minn.) Independent.

There are a lot of families in America so poor that they have only one automobile to their name.—American Lumberman (Chicago).

We are getting ready for airplane traffic. Many of our roads seem to be built for it.—Wichita Beacon.

The real modern parent promises his son an auto if he doesn't smoke or drink until he is twelve years old.—Columbia Record.

INSTALLED

1912

60-Inch
Diameter
52 Feet Long

CITY OF
DAYTONA,
FLORIDA

Armco Culverts Stay Put

Dixie Culvert & Metal Company
Jacksonville, Fla.

INSPECTED

1923

Condition Pronounced

EXCELLENT

By

W. R. BABINGTON,
Superintendent Streets,
in September, 1923, after
a Thorough Inspection.

BASIC PRINCIPLES OF HIGHWAY MANAGEMENT AND FINANCE

(Continued from Page Eleven)

vided for, there can be no objection to applying it to construction.

The wide variation in the present status of highway development in the several States prevents the adoption of a uniform policy for securing the funds necessary to the annual highway budget and expending these funds. Generally speaking, however, these principles may be enunciated:

Principles of Finance

(a) States in the initial stage of highway development should issue bonds to defer that portion of the annual charge for construction which would overburden either property or the road user.

(b) States where original construction programs are well under way, can, in the main, finance further expenditures for construction by bond issues devoted to deferring the cost of special projects.

(c) States where original construction is practically completed are concerned chiefly with maintenance and reconstruction and should depend on current funds, save in cases of emergency.

(d) The maintenance of interstate and State roads should be a charge against the road user.

(e) Roads serving a purely local purpose will generally require only light upkeep and this should be a charge against the adjacent property, which in this case is the first and often the only beneficiary.

(f) No road should ever be improved to an extent in excess of its earning capacity. The return to the public in the form of economic transportation is the sole measure of the worth of such improvements.

GOOD ROADS ARE WORTH THEIR COST

The highway is not simply a road. It is not simply a surface. It is the assurance of the civilizing influence of better communication between sections.

It is the silent, but persistent, factor for the reduction of living costs.

It is an humble, but powerful foe of ignorance for the reason that it makes easily accessible our splendid system of public schools to the people in the rural districts.

It is the safeguard of our food supply. It is a guarantee to the public against the prostrating influence of industrial upheaval and interruption to distribution therefrom.

It is the popular open-air theatre of enjoyment of the family.

It is the text book of nature to our people.

It is the connecting link between the home and the factory.

It is the call to open air; the great physician who makes no charges for his services.

The people who are opposed to good roads oppose them for the same reason that some people oppose our great public school system; they are not informed.

—North Carolina Highway Bulletin.

Ocala Lime Rock—Florida's Natural Road Material

E. W. ELLIS, President. C. G. ROSE, Sec'y-Treas.

Ocala Lime Rock Co.

INCORPORATED

OCALA, FLORIDA

LIME ROCK QUARRIES

Kendrick, on A. C. L. R. R. Santos, on S. A. L. R. R.

Daily Capacity Plants, 2,000 Tons.

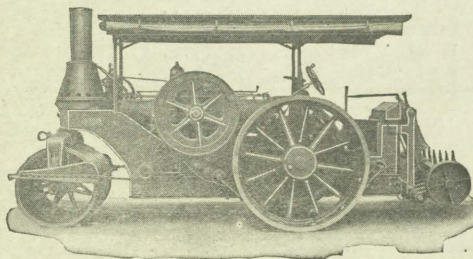
OFFICE

Munroe & Chambliss National Bank Building,
Ocala.

Telegraph: Ocala. Phone 264.

BUFFALO-SPRINGFIELD ROLLERS

The choice of experienced
engineers and contractors



Furnished in all weights and types—
motor and steam propelled.
Inquiries Invited.



The Buffalo Springfield Roller Co.
Springfield, Ohio.



Status of Road Construction

DATE JUNE, 1924

Project No.	Contractor.	Road No.	County	Total Length Miles	Clearing Miles	Grading Miles	Base Miles	Surface Miles	Type	Per Cent Complete
18	Morgan-Hill Paving Co.....	3	Putnam	12.80	12.80	12.66	12.80	12.80	B.M.	99.59
32	State Forces	4	Nassau	10.00	10.00	10.00	10.00	10.00	B.M.	100.00
34	Union Indemnity Co.....	7	Escambia	10.00	10.00	10.00	....	8.20	C.	88.50
36-A	H. L. Clark & Sons.....	4	St. Lucie	7.76	7.76	7.45	7.59	5.35	B.M.	85.20
36-B	C. F. Lytle.....	4	St. Lucie	7.12	7.12	6.41	....	1.78	C.	30.70
37-A	F. W. Long & Co.....	2	Alachua .....	.70	.68	.63	.63	0.00	S.A.	58.00
37-C	F. W. Long & Co.....	2	Alachua	3.26	3.26	3.26	2.28	0.00	S.A.	53.00
37-D	Fla. Drainage & Const. Co..	2	Alachua	2.14	0.00	.42	....	....	G.	20.00
37-E	Wm. P. McDonald Const. Co.	2	Alachua	7.96	7.64	7.56	7.72	4.73	S.A.	75.00
40-A	C. F. Lytle.....	4	Brevard	16.17	12.13	2.42	0.00	....	R.	8.70
40-D	J. Y. Wilson.....	4	Brevard	6.72	3.02	1.68	0.00	....	R.	5.00
40-E	Langston Const. Co.....	4	Brevard	13.60	6.80	4.08	.14	....	R.	9.00
501	State Forces	6	Calhoun	41.19	41.19	39.95	....	40.77	S.C.	99.20
503	State Forces	2	Charlotte	20.18	20.18	20.18	....	19.77	S.C.	98.00
505	State Forces	2	Columbia	11.80	11.80	11.80	11.70	.59	R.(ST.)	89.00
507	Barber-Fortin Co.	4	Flagler-Volusia..	10.00	10.00	10.00	10.00	10.00	R.(ST.)	100.00
519	State Forces	5	Manatee	3.50	3.50	3.15	3.50	0.00	B.M.	82.00
521	Morgan-Hill Paving Co.....	4	Nassau	12.41	5.83	4.09	0.00	....	R.	15.30
523	M. J. Cole (Co. funds).....	8	Okeechobee	8.75	8.75	7.00	7.52	....	R.	85.65
532	State Forces	3	Volusia	18.90	18.90	18.90	18.90	18.90	B.M.	100.00
534-A	J. D. Donahoo & Sons.....	24	Brevard	2.65	2.65	1.59	0.00	....	R.	58.00
534-B	Noll & Noll.....	24	Brevard	11.85	11.85	11.85	6.87	....	R.	57.00
539	County Forces	5	Marion	11.30	11.30	11.30	9.04	0.00	R.(ST.)	53.93
544-A	F. S. Whitney.....	5	Pasco	8.75	8.75	8.66	6.04	....	R.	70.50
544-B	The Barber-Fortin Co.....	5	Pasco	11.33	11.00	7.00	1.47	....	R.	30.00
545	Broadbent & Groeting.....	5	Hernando	9.51	9.51	9.20	5.70	.19	S.A.	43.00
553	State Forces	2	Marion	9.15	9.15	9.15	6.86	0.00	B.M.	49.60
554	Barber-Fortin Co.....	4	Brevard	5.00	5.00	5.00	4.98	....	R.	99.00
560	State Forces	6	Calhoun	20.00	16.00	15.00	....	15.00	S.C.	72.00
562-A	Southern Surety Co.....	8	Highlands	5.37	5.37	5.37	....	....	G.	100.00
562-B	W. P. Kennedy Const. Co..	8	Highlands	10.71	10.71	10.71	10.71	10.60	S.A.	98.00
564-A	Edgar Chapman (Co. funds)	5	Charlotte	10.88	2.51	3.81	....	....	G.	25.00
564-B	Boone & Wester.....	5	Charlotte	9.86	9.86	9.86	....	.98	S.C.	64.90
565	State Forces	1	Madison	15.66	14.87	14.87	....	3.35	S.C.	82.00
570	Morgan-Hill Paving Co.....	5	Manatee	3.96	3.96	3.96	3.96	3.85	B.M.	97.20
571	Hunter & Gladwell.....	1	Madison	14.73	8.10	8.10	....	0.00	S.C.	45.00
572	L. M. Gray.....	13	Bradford	7.30	7.30	7.30	4.16	....	R.	73.00
574	State Forces	9	Madison	11.66	10.96	8.86	....	0.00	S.C.	77.00
575	State Forces	3	Putnam	5.46	5.18	4.69	5.02	.82	R.(ST.)	72.40
576	S. T. Buchanan & Sons.....	5	Sarasota	5.68	3.83	1.53	....	....	G.	30.00
579	State Forces	1	Holmes	8.62	8.19	6.46	....	6.46	S.C.	76.50
586	State Forces	1	Jackson-Wash'ton	17.37	4.51	3.30	....	2.25	S.C.	45.60
594	State Forces	13	Bradford	9.095	9.09	9.09	....	....	G. & D.	100.00
594	L. M. Gray.....	13	Bradford	9.095	....	....	7.54	....	R.	93.50
597	J. Y. Wilson.....	4	Volusia	16.29	6.49	6.49	0.00	....	R.	8.90
598-A	W. J. Bryson Paving Co....	1	Jefferson	9.45	5.33	4.25	....	0.00	S.C.	50.00
598-B	State Forces	1	Jefferson	7.80	5.85	.93	....	0.00	S.C.	8.00
599	M. M. Boyd.....	2	DeSoto-Charlotte.	7.40	7.40	7.03	....	1.11	S.C.	66.00
604	C. F. Lytle.....	4	Volusia	7.72	1.15	0.00	0.00	....	R.	4.30
607	State Forces	13	Bradford	5.10	5.10	5.10	....	....	G.	100.00
607	L. M. Gray.....	13	Bradford	5.10	....	....	.56	....	R.	11.00
608	State Forces	4	Brevard	9.29	6.41	2.78	0.00	....	R.	10.00

TOTAL MILES COMPLETE

	Clearing Miles.	Grading Miles.	Base Miles.	Surface Miles.
Complete May 31, 1924.....	1031.25	980.98	334.45	577.94
Complete June 30, 1924.....	22.04	22.45	18.22	25.54
Total June 30, 1924.....	1053.29	1003.43	352.67	603.48

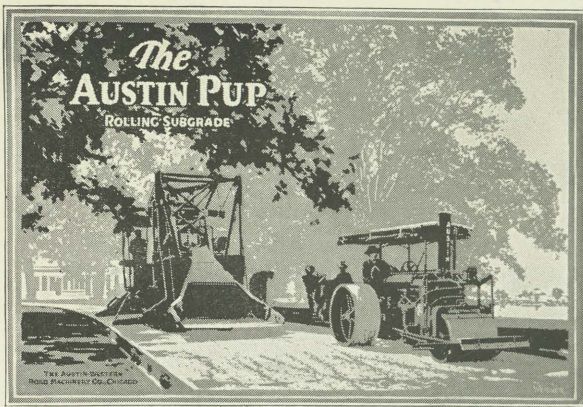
	Concrete.	Brick.	S. Asphalt	Bit. Macadam	S. T. and Rock	Sand Clay	G. & D.	Total
Complete May 31, 1924.....	78.60	25.15	68.62	128.33	102.71	321.90	201.19	926.50
Complete June 30, 1924.....	2.04	0.00	3.20	4.51	15.82	7.42	.95	33.94
Total June 30, 1924.....	80.64	25.15	71.82	132.84	118.53	329.32	202.14	960.44

Note—The above tabulation shows only those projects that are actually under construction at the present time and does not show projects that have been previously completed. However, the table, "Total miles completed," at the foot includes all projects that have been completed prior to June 30, 1924, and the amount completed in June also. The abbreviations used are as follows:

C.—Concrete. S.A.—Sheet asphalt. B.M.—Bituminous macadam. R.—Rock base. S.C.—Sand clay. G. & D.—Graded and drained. S.T.—Surfaced treated.

"I would about as soon attempt to run a concrete paving job without a mixer as without a Pup," writes M. W. Watson, formerly State Highway Engineer of Kansas; and now a prominent contractor.

He then goes on to say, "I am using one of your Pup Rollers on my Federal Aid paving job in Shawnee County, Kansas. And I want to tell you that the Pup does more different things, and does them better, than any machine I have ever seen. One of the boys from our concrete gang, who has never been considered a roller operator, started the Pup, and has operated it successfully, not only as a roller, but a grader, tractor and scarifier."



Combining as it does the features of a roller, leveler, scarifier and tractor, the 3 to 5-ton Pup is a remarkable time, labor and money saver on any job involving one or more of those kinds of work. Hundreds of contractors and public officials are letting the Pup pay for itself out of the money it is saving them; and the chances are that you, too, cannot really afford to be without a Pup since you are actually paying for it anyway.

We will gladly demonstrate to you, right on your own job, that this is so. Now is the time, before it slips your mind, to write for a copy of the catalog and experience records that tell the whole story.

The Austin-Western Road Machinery Company

GENERAL OFFICES:

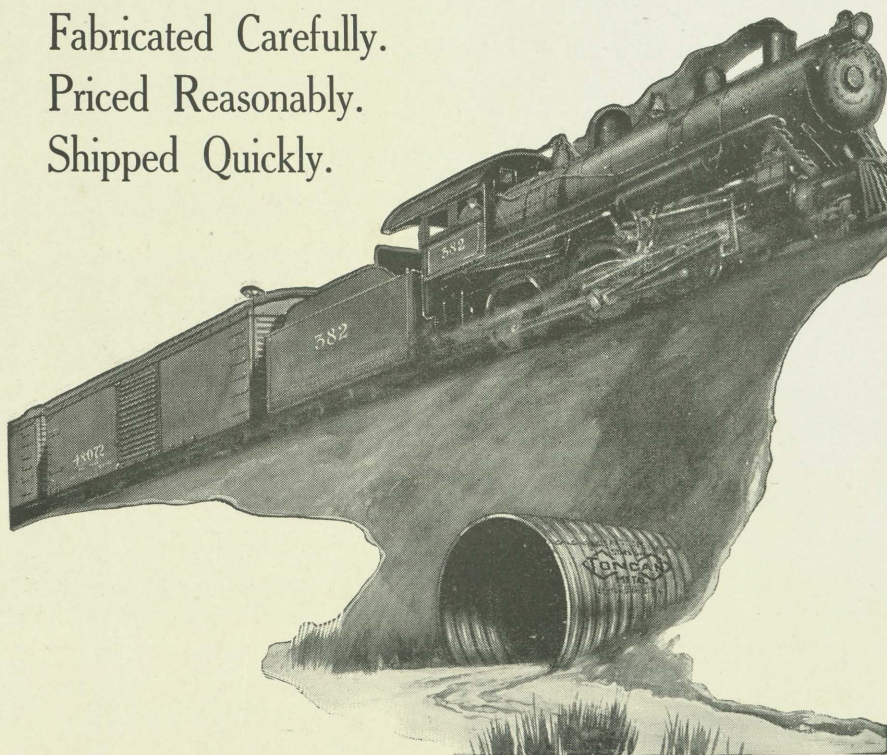
400 North Michigan Ave., Chicago, Illinois.

Northern and Southwestern Florida Representative, ROSCOE KENT, Orlando, Fla.

East Coast Representative, L. D. LLEWELLYN, Suite 214, Bedford Bldg., Miami, Fla.



Fabricated Carefully.
Priced Reasonably.
Shipped Quickly.



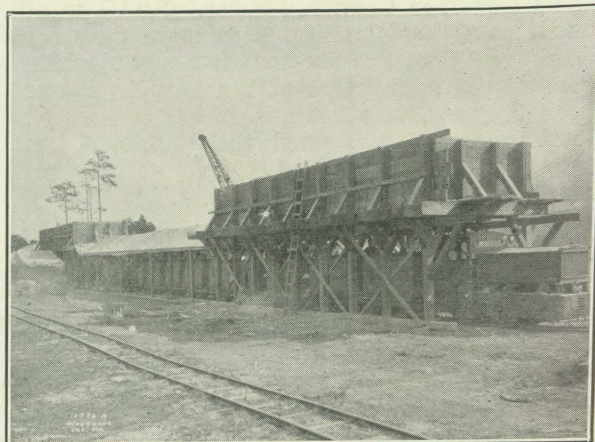
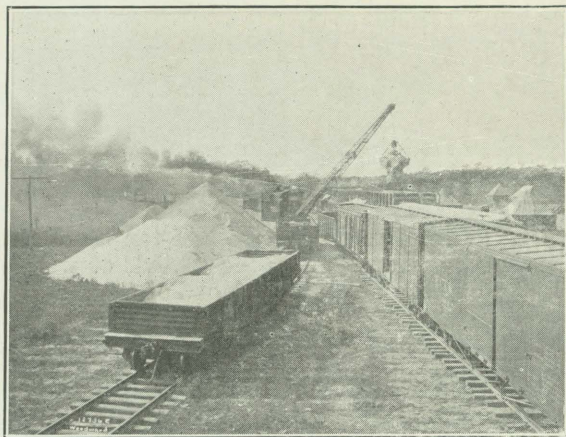
THE BERGER MANUFACTURING CO.
Formerly THE FLORIDA METAL PRODUCTS CO.
JACKSONVILLE, FLA.

“The *Lytle* *Way”*

ORGANIZATION

SYSTEM

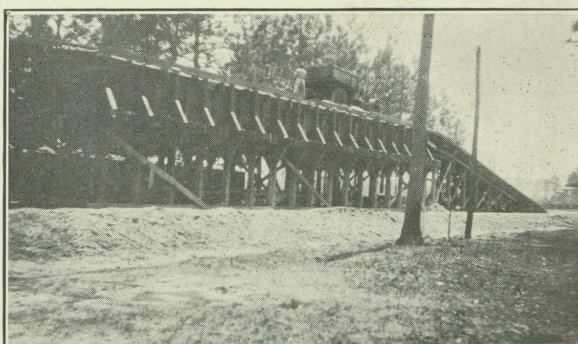
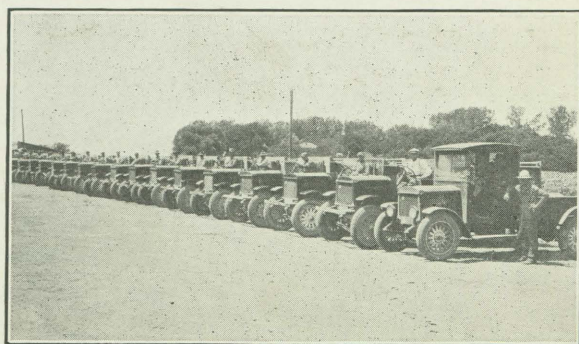
SPEED



Modern
Methods



Modern
Equipment



C. F. LYTLE

JACKSONVILLE, FLORIDA.

SIoux CITY, IOWA.

BUILDER OF CONCRETE PAVEMENTS SINCE 1903